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ABSTRACT

Presented is an empirically oriented, data based program modification (DBPM) manual for individualizing educational plans for any child with a learning or behavioral problem. The rationale for an empirically based program, the socio-legal context, and specific measurement and evaluation procedures (e.g. time series procedures and discrepancy measurement) are described in Part I. Covered in Part II is the sequencing of initial assessment and in Part III a program planning sequence is provided. Program implementation, adjustment, and certification are discussed in Parts IV, V, and VI. Consultation, training, and the indirect role of the resource teacher are treated in Part VII. Featured throughout is the application of DBPM to the case of a hypothetical child. Three appendixes provide appropriate questions for each decision area of the DBPM, case report summaries, and a list of change strategies. (BB)

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Data-Based Program Modification:
A Manual

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University of Minnesota

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Minneapolis, Minnesota

1977

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Foreword

Data-Based Program Modification (DBPM) is a systematic method of individualizing educational plans for children with any kind of learning or behavioral problem. It had its origins in a Special Projects grant to the University of Minnesota in 1971 in which, in collaboration with the Minneapolis Public Schools, an individual program modification system was developed to enable Special Education Resource Teachers (SERTs) to work with regular education teachers to maintain handicapped children in mainstream classrooms. Since then, the University of Minnesota has been training SERTs for service in public schools, and Stan Deno and Phyllis Mirkin have been teaching them the principles and procedures of DBPM. The present state of DBPM owes a great deal to the feedback provided by SERTs out of their on-the-job experiences.

The dissemination of this manual has been undertaken as part of the training and support activities of the Leadership Training Institute/Special Education. Since its initial authorization in 1968 under the Education Professions Development Act, the LTI/SE has functioned as a support system for training projects that focus on enlarging the capabilities of both regular and special education teachers to serve handicapped children within as normal environments as possible, and for projects developing instructional materials for training such teachers. As part of its support system activities, the LTI/SE has assisted relevant projects in the dissemination of reports and other materials that deserve the attention of colleagues but are too specialized for commercial publishers.

In 1972, for example, the LTI/SE made available for national distribution to special educators and special education teacher-training programs Instructional Alternatives for Exceptional Children (E. N. Deno, Editor), the reports of some projects supported by EPDA or Bureau of Education for the Handicapped funds to explore new roles for special education teachers. In the same way, in 1974, the LTI/SE assisted in the dissemination of Instructional Development for Training Teachers of Exceptional Children (S. Thiagarajan, D. S. Semmel, & M. I. Semmel), a sourcebook of ideas and procedures for the development of instructional materials for teacher preparation programs, a project of the Center for Innovation in Teaching the Handicapped at Indiana University. Other dissemination activities of LTI/SE have focused on the integration of handicapped children in mainstream classrooms and the development of within-school skills and materials to make the integration work. (For the bibliographic information on these and other LTI/SE publications, see the listing at the end of this book.)

Like other programmatic instructional materials disseminated by LTI/SE, Data-Based Program Modification is geared to implementing P.L. 94-142. In addition to detailing procedures for writing and evaluating individual education plans, DBPM systematizes procedures to involve parents/guardians and/or pupils in the making of educational decisions that affect the pupils' lives. Indeed, few instructional programs follow the provisions of P.L. 94-142 as closely as DBPM.

Stan Deno has had a long association with the LTI/SE in a training and support role. When the LTI was functioning as a support system for EPDA and Teacher Corps projects, Deno was a highly valued consultant in the field to projects testing new ways of closing the gap between special and regular education and exploring new roles for special educators. Phyllis Mirkin, a doctoral candidate as of this writing, spends a considerable amount of her professional time in conducting workshops for special education teachers on Data-Based Program Modification.

I am very proud to be able to present Data-Based Program Modification to our special education colleagues in the schools and preparation centers.

Maynard C. Reynolds, Director
Leadership Training Institute/
Special Education
University of Minnesota

Acknowledgements

A great many people have contributed to the development and refinement of Data-Based Program Modification. We are particularly grateful to all the Special Education Resource Teachers who, in sharing their experiences and suggestions with us, helped to bring DBPM to the form presented here.

We are indebted to Dr. Maynard C. Reynolds and Ms. Karen Lundholm, Director and Assistant to the Director, respectively, of the Leadership Training Institute/Special Education, for their encouragement in publishing this Manual, and to Sylvia W. Rosen for editing, designing, and supervising its production.

We are grateful to Sue McClure and Sue Bye for their good-natured willingness to type our manuscript and its many revisions; to Vickie Morgan for the care and artistry with which she executed the many graphs; and especially to Kathy Bass, whose dedication to producing the final copy was far above the ordinary.

Stanley L. Deno
Phyllis K. Mirkin

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ORGANIZATION OF BOOK

This presentation of Data-Based Program Modification (DBPM) has seven parts. Part I contains three chapters of introductory material: (a) the rationale for the use of DBPM to develop programs for students who are identified as having learning problems; (b) the contextual framework for DBPM; and (c) the measurement procedures that are basic to DBPM.

The core of DBPM is presented in Parts II-VI. In them there are detailed the specific, step-by-step procedures for carrying out DBPM.

Part II (Chapters IV-VI) covers the specific sequence of activities in the initial assessment phase: (a) communicating and collaborating with teachers, parents, other professionals, and students to identify the problems which are the basis of the referral; (b) measuring student progress and performance on specific tasks; and (c) evaluating the results of these procedures.

Part III (Chapter VII) continues the sequence of activities during program planning.

Part IV (Chapter VIII), Part V (Chapter IX), and Part VI (Chapter X) cover, in succession, the program implementation, program adjustment, and program certification activities of DBPM.

Part VII (Chapter XI) concentrates on consultation and training, activities in which the Special Education Resource Teacher assumes an indirect service role.

A feature of the Manual is the application of the principles of DBPM to the case of a hypothetical child with a number of learning and behavior problems. Thus, the materials that are used to gather data, make decisions, and communicate with teachers and parents are presented as if for an actual student. The materials also suggest the kinds of information which can be generated with DBPM.

Many of the forms and materials, especially those in Chapter III and Appendix B, may be reproduced. However, they need not be used exactly as illustrated for DBPM to work. Because DBPM is first and foremost a set of principles and procedures, we encourage each person to adapt the procedures and forms to the specifics of each particular school environment.

Due to the limitations of publication all the graphs in this manual are drawn in one color. Normally, in practice, the different symbols and lines would be drawn in colors. To avoid confusion in the presented graphs trend lines have been omitted.

PART I

Introduction to Data-Based Program Modification

Chapter I

THE CONTEXTUAL FRAMEWORK

Classroom teachers today are being required to assume responsibility for serving children with a broader range of individual differences than at any period since the one-room school. This mandate is based on court decisions in which there is clearly stated the social philosophy that the first priority of education is individual enhancement rather than societal convenience. Where educational placements were once made to serve the majority interests, placements now must be made to serve the needs of the individual student.

The changes demanded of the schools and teachers under this new philosophy are large but not insurmountable. Most teachers have been long aware of the heterogeneity of even a so-called homogeneous classroom group, and they recognize the need to adapt educational methods and materials to the individual learner, if on a limited scale. The increased range of behavioral difference in the classrooms which has been brought about by judicial mandates has simply served to make it even clearer that providing an appropriate education for the individual necessitates tailoring or custom fitting programs to a degree not presently accomplished in the schools.

To help classroom teachers meet this new responsibility, an increased number of models or systems for individualizing instruction have been advanced by professional educators, especially those identified with special education. Special educators have become particularly concerned with individualization because, unlike their general education colleagues, they always have concentrated on the individual problems of the children who have been referred out of normal educational programs. Yet, no method or system of individualized programing now available is adequate for all children, in all classroom settings, and under all circumstances. No wonder so many teachers currently in service and in training have become suspicious of the grandiose claims often made for "individualization"!

Data-Based Program Modification (DBPM) is not offered as a solution to all educational problems. What is offered, instead, is the set of procedures making up DBPM which provide the means of evaluating alternative solutions to the learning problems of most students encountering school difficulties. When implemented, the procedures provide valuable tools for the resolution of problems that face teachers as they try to modify instruction for children who have not previously been appropriately served in prevailing educational programs. The procedures have been developed in large part out of the actual experiences of many teachers in a number of schools in and around the Minneapolis-St. Paul (Minn.) metropolitan area who exchanged their traditional role of special teacher in a self-contained classroom for one of resource teacher to exceptional children in regular school classrooms. By making this book available throughout the country, the authors hope that the DBPM procedures will aid educators who are searching for more effective institutional programs for children with diverse needs in the regular classroom.

Social and Legal Background:

The Judicial Mandates

The persons we have usually grouped together under the category labels of "exceptional" and "handicapped" clearly have one characteristic in common--their behavior deviates significantly from normative development. Behavioral deviation created stress in the schools because educational programs were organized around normative development. The sociologist, Jane Mercer (note 1), pointed out that societies usually adopt at least one of three strategies for coping with deviance: (a) "exclusion or exemption"; (b) "deviate status placement"; or (c) "intensification of socialization."

The first strategy, *exclusion*, deprives the exceptional individual of all status within the group because, by definition, he does not meet group norms. Thus, the process of exclusion places the individual outside the group and makes him an alien.

The second strategy, *deviate status placement*, occurs when exceptional persons are allowed to stay within the social system but are assigned a special status and role expectations that are quite different from the ordinary. Since the expectations are different, the status is not so highly valued by members of the society and, therefore, the deviate status tends to be stigmatizing.

The third strategy, *intensification of socialization*, occurs when a society tries to "normalize" the exceptional person's behavior through education, rehabilitation, and therapy. When adopted, this intensification strategy implies that the individual, although a deviate, is still a group member and the expectations held for him are basically ordinary.

The history of educational programs for the children described as exceptional or handicapped essentially parallels the three strategies identified by Mercer. Prior to the 1870s the response of the public schools to what were sometimes called "wretched unfortunates" was to exclude them entirely from the educational process. With the advent of compulsory school attendance laws, the strategy of exclusion was changed to deviate status placement. A continuum of special status was created for children of "filthy or vicious habits." Initially, deaf, blind, or physically handicapped children were instititionalized in 24-hour schools where they could be isolated from the normal community. Between 1920 and 1960, as a result of external pressures, special day schools and special classes for "misfits" of any kind were developed within communities until, by the 1950s even children whose development was so retarded that they were given the label "trainable" began to participate in special classes in public school programs.

It is well to remember that the development of public school programs for deviate status individuals has occurred essentially as a result of special legislation to support special programs for the children who are identified as "handicapped" or "exceptional" by the laws. Yet, the public financing for such programs is still based essentially on deviate status placement in that the children declared eligible for special education services must first be labeled learning disabled, emotionally disturbed, mentally retarded, deaf, blind, or physically handicapped.

The most significant recent developments in the education of exceptional children have occurred through the courts. Beginning with Diana v. State Board of Education (1970) and proceeding through a series of subsequent court decisions, the right to equal educational opportunity (usually called the right to education) has been extended to all handicapped persons, regardless of level of development. (For a concise discussion of the origins of the judicial determination of the right to education, see Gilhool, 1976.) This right has come to mean that even persons who are bedridden and who formerly received only health-care maintenance now must be provided with state-supported instruction, if only to enhance their life skills.

The right to education litigation has been based on the Fourteenth Amendment, which provides equal rights under the Constitution. The extension of equal educational opportunity to even the most profoundly handicapped children, however, was influenced by more than social ethics. Much of the testimony brought to bear on these decisions related to whether all children could, in fact, benefit from education. The favorable court decisions might not have been enunciated were it not for the fact that many patient and understanding teachers have demonstrated that all children are teachable. Without these demonstrations it might have been possible to argue that the right to education, with its implication of the ability to learn, does not apply to handicapped persons. Sufficient evidence has been provided, however, to persuade the courts that all persons, regardless of the magnitude of their disabilities, can profit from training and, therefore, all persons have the right to publicly supported education.

Normalization Principle

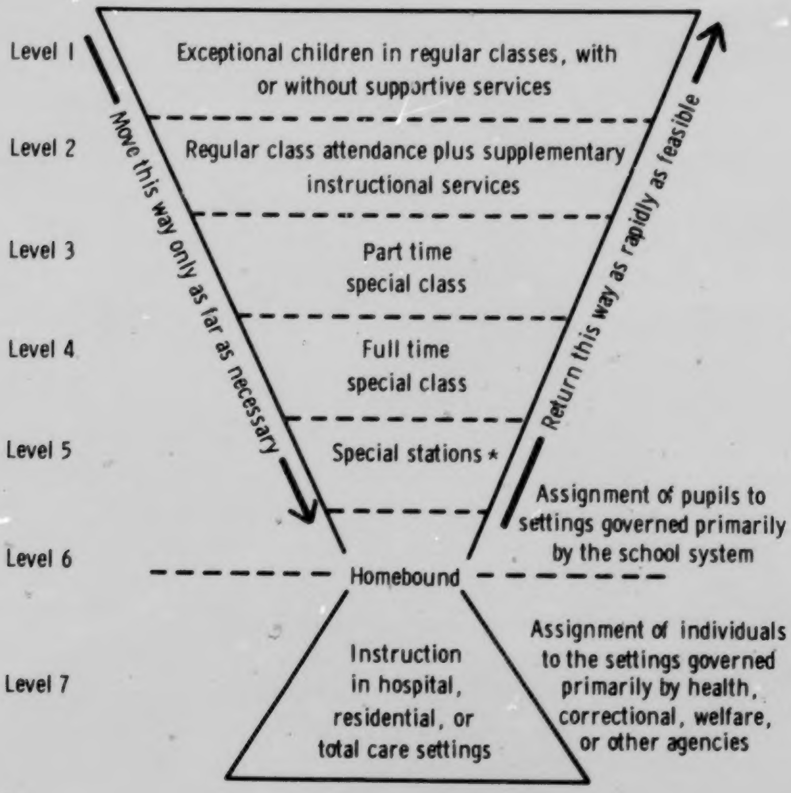
The right to education decisions have led to a second order or derivative legal principle influencing current educational programing for handicapped persons--the doctrine of least restrictive alternative. This doctrine states, essentially, that the educational programs provided for all (handicapped) pupils must be the least restrictive of the range of choices or options available. The doctrine is intended to prevent schools from using exclusion or deviate status placement as routine strategies in the education of handicapped children unless such strategies prove to restrict the opportunities available to them the least. The assumption is that unless a sufficient case can be made for an alternative educational setting, the least restrictive environment for the individual and, therefore, the one in which he belongs, is the modal educational program. For the large majority of handicapped children this modal program is the regular classroom--the mainstream.

Any alternative to the educational mainstream must be shown to be in the best interests of the individual before he is placed. To insure that the student's best interests are met, schools are required to observe due process under the law whenever a placement out of the modal program is contemplated. In addition, should the student's parents or guardians believe that a program change does not best serve the child, they have the right to call for a due process hearing and to have legal representation. It is important to emphasize at this point that tutoring in resource rooms constitutes a program change which a parent has the right to challenge.

As the courts have moved to clarify and protect individual rights within education, educators have, in Mercer's words, "intensified their efforts to socialize" (note 1, p. 1) rather than to reject or label individuals. This effort has become known as the "normalization principle" (Nirje. 1969). As applied to educational programs, the principle holds that every effort must be made to normalize educational environments and behaviors for exceptional persons. The application of this principle in educational organization is considered in the following section.

Implications of Court Decisions

The right to equal educational opportunity and the doctrine of least restrictive alternative are fundamental educational principles. They have become integral to program organization and policy within local school systems and are implemented through what educators call "normalization" and "mainstreaming." Where "normal" children once were served in regular education programs and "handicapped" children in segregated (separate and theoretically equal) special education programs, it is now the policy to serve all children through a continuum of alternatives. The Council for Exceptional Children (CEC) adopted as a part of its policy statement, in 1971, the "Cascade of Special Education Service Model" (Fig. I-1.).


Level 1
Exceptional children in regular classes, with or without supportive services
Level 2
Regular class attendance plus supplementary instructional services
Level 3
Part time special class
Level 4
Full time special class
Level 5
Special stations *
Level 6
Homebound
Level 7
Instruction in hospital, residential, or total care settings
Move this way only as far as necessary
Return this way as rapidly as feasible
Assignment of pupils to settings governed primarily by the school system
Assignment of individuals to the settings governed primarily by health, correctional, welfare, or other agencies

* Special schools in public school systems

Fig. I-1. The cascade system of special education service. Source: "Special Education as Developmental Capital" by E.N. Deno. *Exceptional Children*, 1970, *37*(3), 229-237, 235. Copyrighted by The Council for Exceptional Children.

The Cascade of Services Model provides local school districts with a framework to organize alternative administrative options for each handicapped pupil and to make the appropriate placement decision for each. The tapered shape of the model reflects the decreasing number or proportion of children who are served in the different placements. The right to education and doctrine of least restrictive alternative are illustrated by the arrows governing movement or placement decisions down and up the Cascade. Movement out of the regular classroom (down the Cascade) is usually considered to depend on the severity of an individual's handicapping condition.

Consistent with CEC policy, state education agencies have begun to adopt the Cascade or some version thereof; and considerable effort has been directed toward moving students, previously segregated into levels 4-7 of the model, into levels of service more closely approximating normality. For the children at level 7, this movement has been characterized by both deinstitutionalization (the creation of community alternatives) and the assumption of educational responsibility within necessary institutions by local school systems. For children at levels 2, 3, and 4, the movement to normalize educational environments has created the need for better articulation mechanisms between regular and special education which allow freer and less life-disrupting movement along the continuum of alternatives. A major problem, however, is that virtually all states require by law that before special education monies may be used to provide an appropriate program for a student, the student be given a handicap label. In effect, then, the legislation rewards school systems (with special education monies) for finding and labeling children as exceptional.

With or without incentives, the schools have had no difficulty in labeling some children as deviant. For example, Rubin and Balow (1971), in their educational follow-up studies of 1240 children without overt handicapping conditions, found that by the fourth grade, 41% of their sample already had been identified as deviant enough to warrant some form of intervention, and 24% had received some special education services. More recently, they discovered in their longitudinal data that by the time each pupil had been rated by four different classroom teachers, over half of the girls and about three-fourths of the boys had been rated as behavior problems by one or more of the teachers (Rubin, note 2).

Implications of Policy for Instruction

Current organizational patterns and policy in special education contain at least the following implications for the instruction of handicapped children:

Imperatives	Implications
1. The program goals for all students, regardless of the nature of their handicaps, must be derived from an analysis of those behaviors that are necessary to function in a less restrictive environment.	In a practical sense, this imperative means that teachers at any level of the Cascade should determine the behaviors that are necessary for the children to function at the next higher level, and they should direct their instruction toward those behaviors. To do so at level 2, for example, would eliminate the setting of auditory and visual processing tasks as educational objectives unless the value of the tasks for level 1 performance could be demonstrated.
2. Placement of a pupil in an educational setting should be determined by his present repertoire of behaviors rather than his diagnostic label (e.g., learning disabled, dyslexic, minimally brain damaged, neurologically impaired, emotionally disturbed).	Present assumptions are that labels may be necessary to justify the use of program resources but not, generally, to make instructional program decisions. Further, it is generally believed that labeling has had detrimental effects on individual development; for that reason alone they should be avoided.
3. The success of instructional programs should be based on the rate at which the program moves the pupil toward functioning in more normal environments.	At the level of instruction, this imperative means that evidence must be presented that the pupil is making progress along a sequence of approximations to normality. If a "special" education program cannot demonstrably improve a child's rate of development, it is indefens-

ible as a service. We are critical of defining quality of service in terms of time, program, or teacher-pupil ratio.

4. Whenever possible, special educational services for handicapped students should be brought to the individual rather than bringing the individual to the services.

In effect, this imperative means that revision in either instructional objectives or instructional treatments should occur within the natural environment (i.e., home, school, and community) rather than in one that is foreign to the child (i.e., special class, school, or residential center). In practical terms, this imperative has produced the need to retrain regular school personnel so that they can individualize instructional programs and, thereby, increase classroom tolerance for behavioral diversity.

The policy issues in the education of handicapped children are, with the help of the courts, becoming clearer, and the implications of the issues for the administrative organization of educational programs can be identifed. The problem that remains, in fact, is to create educational programs that effectively produce the greater inclusion of persons into the mainstream of our society. In creating educational programs for including handicapped students, we must be mindful of the lessons already learned in other integration attempts! Effective programs are defined not in terms of their procedures but, rather, of their outcomes. Placing students with skill deficiencies in more normal settings means nothing unless the placement enhances their development and has positive affects on the behavior of the peers with whom they must interact. In addition, the reality is that general educational programs, regardless of attempts to individualize them, will always be unable to provide an appropriate education for some proportion of children.

While the implications of social policy and legal responsibilities in serving exceptional individuals have become clear, what is not so clear is how these policies should be operationalized. How do we bring specialized services to children who require them in a way that protects their rights?

The procedures presented in this manual represent an attempt to operationalize both social policy and legal reponsibility. Appropriate application of the procedures requires an understanding of the assumptions upon which DBPM is based.

Basic Assumptions of Data-Based Program Modification

Five assumptions constitute the basis for DBPM. Although DBPM is advanced as a way of developing program modifications for handicapped students, its procedures are equally applicable to all children's programs, of course.

ASSUMPTION #1

> At the present time we are unable to prescribe specific and effective changes in instruction for individual pupils with certainty. Therefore, changes in instructional programs which are arranged for an individual child can be treated only as hypotheses which must be empirically tested before a decision can be made on whether they are effective for that child.

Two factors strongly influence this assumption:

1. A substantial and growing body of literature is addressing the difficulties encountered when differential diagnosis is used as the basis for program prescription (Quay, 1973; Ysseldyke & Salvia, 1974). At the heart of differential diagnosis or "diagnostic-prescriptive instruction," as it is popularly called, is the premise that it is possible to measure a child's *abilities* by using a battery of highly specific standardized tests and then, on the basis of these test results--the *differential diagnosis*--to prescribe a program that is more likely to be successful for the child than a program designed without such diagnostic information. This premise is false. If one acts as though it were true, one is following Campbell and Stanley's (1963) "trapped administrator" who introduces a reform as if it were certain to be successful when the probability of success is unknown, in fact. Ysseldyke and Salvia (1974) concluded that the empirical technological basis for such diagnostic-prescriptive procedures, as they are commonly advocated and practiced, is so inadequate that the children subjected to them are, in effect, involuntarily participating in uncontrolled experiments.

2. It is becoming increasingly evident that a methodological error is committed when measurement and prediction procedures, which, at best, are only modestly accurate for groups, are applied to the prediction of individual performance. For example, by collecting statistics over the years, the National Safety Council is able to predict with a fair degree of accuracy the number of deaths that will occur on the nation's highways over a given holiday; it would be a misuse of the data, of course, to try to predict the identities of the victims. In the same way, achievement can be predicted from aptitude test data fairly accurately for groups but distressingly inaccurately for individuals.

The point is easily appreciated by the experienced teacher who has had many opportunities to observe that what may work with some members of a group will not work for others, and that it is not always possible to know which children will benefit and which will not. Prediction is always poorer when the prediction is made for one case.

The inevitable conclusion to be drawn is that with our present level of knowledge about the kind of instruction that should be provided a child who posseses a given set of aptitudes (or traits), and the current capability of our technology to make individually accurate predictions, we are in the same position as pharmacists who sell over-the-counter medications without knowing whether they will benefit the customers who take them. The reality of all political, social, and educational reforms is that their effects are hypothesized rather than known; thus they should be treated as hypotheses ("hunches") whose effects must be measured and evaluated. In Campbell's (1969) words, we should treat our "reforms as experiments."

ASSUMPTION #2

> Time series research designs are uniquely appropriate for testing instructional reforms (hypotheses) which are intended to improve individual performance.

By definition, "A time series is a set of data ordered in time, typically observations made at regular intervals" (Tintner, 1968, *16*, p. 47). Perhaps nothing better characterizes the kind of data a teacher collects than the definition of a time series. What is a sensitive teacher doing if not observing his/her student each day and making changes in instruction based on these regular observations? What teachers typically do not do, however, is to observe with order and precision, which permit valid conclusions to be drawn about the relation between instructional changes and students' responses (achievements). The unfortunate consequence of this lack of order and precision is that teachers develop what B.F. Skinner called "superstitious behavior."

Superstitious behavior is behavior that occurs frequently because it has been followed accidentally by a desirable (reinforcing) event. The adverb "accidentally" indicates that the desirable event was not the outcome of (not "produced" by) the behavior but, instead, a coincidental sequel to the behavior in time, thus making it seem that the behavior produced the desirable event. Such accidental occurrences produce increases in behavior just as surely as true (non-accidental) consequences. In the laboratory, this phenomenon is exemplified by the pigeon that learns to bow or turn in a circle when given food, although the food is delivered every 15 seconds regardless of what the pigeon is doing. A social example is the rituals enacted by professional athletes. Coaches have been known to wear the same pair of socks without washing them so long as their teams win; most of us, however, see the relation between dirty socks and winning as purely accidental!

How does the unsystematic and imprecise observation of student performance and frequent instructional changes in relation to that performance result in superstitious behavior in teachers? If the discussion to this point has been clear, you know the answer. Since changes in student behavior (usually but not always achievement of academic skills) are important desirable outcomes for teachers, the occurrence of the changes after any teaching activity is likely to result in an increase in that activity, *whether or not the teaching activity produced the behavior changes*! Let us look at a hypothetical case (which is not so hypothetical in many classrooms).

The teacher institutes a program of reading instruction for a child with visual weaknesses who is two years below grade level. The program has been developed to capitalize upon the child's auditory strengths and de-emphasize his visual weaknesses (e.g., decoding-encoding emphasis). To implement this program, the child is removed from his regular reading group and is tutored, instead, by the resource teacher. After six months, the child is tested in reading and is found to have advanced one year. The teacher considers this result to be evidence that the auditory program is highly effective. Not only does the teacher continue to use the program with the child but, very likely, with "similar" children as well. In fact, the teacher probably shares the knowledge with colleagues.

Is this teacher engaging in superstitious behavior? The answer is "no" if the auditory program alone actually produced the change in the child's achievemnt. The answer is "yes" if the improved achievement was the outcome of other aspects of the program, such as the individual instruction or increased practice in reading, and appeared coincidentally following instruction in the auditory program. Many teachers who routinely award tokens to children never know whether the instructional program or the tokens are responsible for the children's progress.

Given the large number of academic and social behavior changes occurring routinely in the school, it is safe to assume that many are coincidental to different teacher behaviors, but these coincidental occurrences result in superstitious teaching behavior unless the teachers impose order and precision on their work.

What order and precision is required? The details are discussed completely in the remainder of this book but some introduction can be provided here. (a) Order can be imposed on the process of observation if the teacher structures the sequence of changes in instruction so that reliable and valid information can be obtained. (b) Precision is obtained by observing the child's behavior during each change and converting this record into numbers. When changes in instruction are introduced in such an orderly manner, their effects can be interpreted through the examination of the numerical data. When order and precision are imposed on teaching activities, a time series experiment is created enabling systematic tests of plausible instructional hypotheses on how best to help a child develop. It should be evident that treating teaching like time series experiments reduces the likelihood of developing superstitious behavior and increases the likelihood that an effective instructional program will be cumulatively constructed from hypotheses that are empirically verified.

ASSUMPTION #3

> Special education is an intervention system, created to produce reforms in the educational programs of selected individuals, which can (and, now, with due process requirements, must) be empirically tested.

All of us have experienced the ill effects of social institutions or programs that were designed to work to our benefit. To sue a physician who, presumably, has applied his skills to healing would be unthinkable were it not for the evidence that physicians sometimes engage in malpractices for which they must be held accountable. The story, One Flew over the Cuckoo's Nest (Kesey, 1962), sensitized us to the potential abuses of patients in state hospitals. And we have become distressingly aware of the mistreatment of minorities by all social institutions, including our schools.

In 1968, Lloyd Dunn pointed out that research on special class placement of mildly retarded pupils indicated that such placement is as likely to decrease as increase the educational achievement of children so placed. Earlier in this chapter we briefly traced the history of education for exceptional children and tried to show that education for exceptional persons has been conducted as much (if not more) to suit the convenience of the majority as to benefit the individual. With the passage of P.L. 94-142,[1] which requires states to develop due process protections for children in school, we have arrived at the point where we must demonstrate that reforms in the instruction provided for youngsters are of demonstrable benefit or we must halt them.

The arguments supporting assumptions #1 and #2 establish that we cannot know in advance whether a specific reform will, in fact, benefit a child, and that the best methodology currently available for empirically verifying instructional hypotheses is the time series design. The implication we draw from the presented facts is that we are obliged to apply time series research designs to evaluate the effects of special education services provided for every pupil. (Chapter III is largely devoted to the procedures of applying time series data analysis to special education programing.)

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[1] P.L. 94-142, Education for all Handicapped Children Act.

ASSUMPTION #4

> To apply time series designs to (special) educational reforms we need to specify the data representing the "vital signs" of educational development which can be routinely (frequently) obtained in and out of school.

To most of us, it is unthinkable that medical treatments not be tailored in response to our "vital signs" (i.e., heart rate, blood pressure, temperature, etc.). Medical practice is largely based upon routine measures which are so simple to administer that most of us can and do appraise our own health with some precision. What are the "vital signs" of educational "health"? What measures do teachers routinely administer to check the development of their students?

Regrettably, the routine measurement of performance is not a common practice in the schools. The best that we usually have to offer is testing at the end of a unit of instruction for grading purposes. More often, in the elementary grades, teachers estimate a child's current level of development in a subject like reading by referring to the instructional group (high, middle, or low) the child is in, whether the group is "on grade level," and whether the child is "doing fine" or "needs improvement." Such imprecise estimates can be called "measures" in only the grossest sense of the word.

Worse, little or no agreement exists regarding the performances that index growth in critical curricular areas like reading, written language, and math. General agreement exists that the purpose of reading is "comprehension," but at the present time, no operational definition of the term "comprehension" is agreeable to even a modest proportion of experts in reading. In mathematics, most teachers spend a great deal of time on basic computational skills, and the "return to the basics" movement has been given impetus by falling scores on college entrance tests. At the same time, prominent curriculum experts decry the overemphasis on computation at the expense of conceptual development.

Our response to these problems is twofold:

1. We concur that no universally accepted or used "vital signs" have been established in any area of educational development and that, for the present, what is critical for exceptional persons is to develop those behaviors that are necessary for them to function in the environments to which they (or their parents or guardians) aspire. (This point was made earlier as Assumption #1.) Defined in this way, exceptionality always will refer to the difference between a person's performance and the cultural expectations for performance on a culturally relevant task. From this viewpoint, "vital signs" are always culturally relative; their identification requires the specification of (a) the culture or social setting in which the individual is to function (i.e., classroom, school, neighborhood, etc.); (b) the tasks and their relative importance; and (c) who decides what is acceptable performance on those tasks. With this information in hand, it should be possible to develop a system for routinely monitoring performance on vital signs which is at least functional for building and evaluating educational reforms. When more generally agreed upon vital signs are developed, we believe the same general approach can be used.

2. We suggest that the quantitative index of "health" consists of the relative difference between the individual's level of performance and the performance which is desired from individuals within the culture. We have called this relative difference the "discrepancy ratio." (Procedures for computing such ratios are introduced in Chapter III and detailed in subsequent chapters.) The discrepancy ratio is useful because it allows for fairly precise comparisons of

discrepancies across all academic and social tasks deemed "vital" by a culture, regardless of age or level of performance. We suspect that some form of discrepancy ratio, in the long run, may be more useful in making decisions about who is eligible for special education services than the test information that is currently used.

We hope that the eventual outcome of the search for measurable "vital signs" will be to place in the hands of teachers and parents the equivalent of good "thermometers" which they can use more frequently and clearly to index children's educational progress--an outcome that is sure to make all concerned persons more responsive to the immediate needs of the child.

ASSUMPTION #5

> Testing program modifications (reforms) requires well-trained professionals capable of using time series data analysis to draw valid conclusions about program effects.

A key to resolving the counteracting forces of exclusion and inclusion in education is the availability of highly skilled professionals at the point of articulation between modal (general) education programs and special educational support. Competent professionals at this point can provide support to the general educator as well as protection for the rights of exceptional children. At the University of Minnesota, for example, these professionals are called Special Education Resource Teachers (SERTs); however, their role and functions are more important than the title (Deno & Gross, 1972). The role, under various titles, has emerged in a substantial number of states and programs across the United States (E. Deno, 1972). The SERT, ordinarily, is a school-based (rather than itinerant) teacher/consultant who is the first person to whom the regular class teacher turns when he recognizes that the modal program is not optimum for a child's continued personal-social or academic development. The SERT is a specialist who is capable of organizing and managing individual program modifications that at once meet the requirements of due process and effect the improvement of individual development. This guarantee of both protection and success can be met only through the use of procedures for the continuous objective evaluation of programs and their impacts on individual children.

In response to the requirements for due process specified in P.L. 93-380 and 94-142 many state education agencies have proposed regulations that require that the educational assessment of a handicapped student be made primarily within the responsible school district; preferably at the school which the child attends; and, *to the maximum extent feasible, by persons who will carry responsibility for implementing the instructional program for the child.* Regulations such as these virtually demand the inclusion of the SERT role in every building.

Several features of the role filled by the SERT are worth emphasizing inasmuch as the role places a heavy burden on interpersonal and resource management skills and on cooperative planning and case management.

1. SERTs are much more heavily involved in the diagnostic process than teachers usually are, and for that reason they must have knowledge of psychological or medical diagnostic procedures and social work evaluations and be skilled in formal and informal educational diagnoses.

2. Since the SERT coordinates the assessment of the problem, marshalls resources, communicates with staff, and manages paraprofessionals, much more of his time must be reserved for these activities instead of for direct instruction. (This point is difficult to establish with both SERTs and their colleagues.)

3. SERTs are responsible for collaborative decision making. All program changes are

considered with the child and the teacher. Program modifications that involve separating the child from the regular classroom must be reviewed and recommended by a building special services team. (See P.L. 94-142.)

4. SERTs are involved in direct instruction primarily during initial assessment and the development of an effective program modification. SERTs must be skilled in using alternative methods and materials to develop effective instructional programs. The basis for making program decisions in DBPM is the information that is generated and recorded. It is inseparable from the instructional process rather than an added-on evaluation requirement, such as that of pre- and post-standardized testing.

5. The pressure is, and always should be, on turning over direct instruction and management of an effective program to the child, the regular classroom teacher, a peer, or a paraprofessional. Thus the SERT is free to develop additional effective individualizations instead of being restricted to a static caseload.

6. The progress of handicapped children is monitored by SERTs. They are responsible for charting the progress of all handicapped children on a regular basis, whether or not they are directly instructing the children themselves. Special education must be committed to insuring the children's success, not necessarily to directing instruction. Regular and continuous monitoring of progress is the basis for establishing this accountability.

The skills required for functioning in the role of resource/consultant specialist (SERT) are the focus of this manual. As we have noted previously, we call these skills, and the procedures of their implementation, *Data-Based Program Modification.*

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Chapter II

THE CONCEPTUAL FRAMEWORK

The Model

The conceptual framework for the DBPM activities in which SERTs engage is an adaptation of the evaluation model which was developed by the Center for the Study of Evaluation (CSE) (Klein, Fenstermacher & Aiken, 1971). This model (Fig. II-1) describes five decision (decision-making) areas and five concomitant program (data-gathering) phases through which developers move to improve program performance. Although, at first glance, the names of the model's elements may be unfamiliar to educators accustomed to other terminology; they are related to the common experience of teachers. Similarity can be seen between terms like "needs assessment" and "educational diagnosis" or "program planning" and "lesson planning."

Why have we introduced a new terminology (or jargon) when the vocabulary already used by teachers to describe their activities is similar? Because the terminology of the model is based on a larger and more general perspective of the processes of modifying children's programs. For example, the term "program modification," unlike a term like "instruction," emphasizes the fact that some solutions to problems are not instructional (e.g., negotiating new administrative arrangements for a pupil or modifying the program goals for a pupil), but are used rightly for part of the SERT's activities.

The model clearly identifies the decisions that educators must make in the process of creating or modifying educational programs. Given the current emphasis on "due process" and the judicial

DECISION AREA	EVALUATION REQUIREMENT
PROBLEM SELECTION	INITIAL NEEDS ASSESSMENT
PROGRAM SELECTION	PROGRAM PLANNING
PROGRAM OPERATIONALIZATION	IMPLEMENTATION EVALUATION (INTERVENTION)
PROGRAM IMPROVEMENT	PROGRESS EVALUATION (INTERVENTION)
PROGRAM CERTIFICATION	OUTCOME EVALUATION (NONINTERVENTION)

Fig. II-1. Evaluation model used in data-based program modification. Adapted from "The Center's Changing Evaluation Model" by S. Klein, G. Fenstermacher, & M.C., Aiken. *Evaluation Comment*, 1971, 2(4), 9-12.

mandates underlying progressive integration (mainstreaming), greater care must be given to developing accountability for decision making in educational programing. We hope that educators will not become mired in legal proceedings, but they must become capable of documenting "who made what decisions and how those decisions were made." Furthermore, since the model is an evaluation model, it emphasizes the importance of data collection in decision making; at the same time, it makes clear that *while decisions are (or should be) based on data, decision making is separate from data collection and involves people and values as well as numbers.*

The application of the model to the modification of an individual child's program generates (a) a set of specific decisions which must be made and (b) a set of activities which must be undertaken to provide the data base for the decisions. The decisions which must be made have been cast in the form of questions, and the activities which must be undertaken have been categorized as different data-gathering processes.

Evaluation Requirements

Each decision area is addressed to answering a different question. Each program phase is organized around the gathering of specific data that become the basis for making the related decision. Table II-1 identifies the questions to be answered and the data to be gathered during each of the five program phases in relation to the five decision areas.

We regard the information-gathering activities identified in Table II-1 as the responsibility of the SERT, although it need not be. In contrast, the decisions which must be made are shared with the other persons who are responsible for a child's program. Thus, decision making is collaborative while data-collection activities are the primary responsibility of the special educator or a specified colleague.

Additional Activities Related to the SERT Role

In our preparation of personnel to function in the SERT role, we have been reminded that management of program modifications involves activities in addition to those listed in the CSE Evaluation Model. What has become obvious is the crucial role of successful communication and collaboration with other persons who are concerned with the identification and resolution of the problems(s), and the importance of consultation and training in long-range efforts to integrate exceptional children into regular classrooms. For that reason we have identified *communication and collaboration*, on the one hand, and *consultation and training*, on the other, as major activities which are undertaken by SERTs as part of their DBPM functions. Adding these two activities to "measurement and evaluation" (the data-gathering processes) has resulted in the identification of four major processes that intersect with the five decision area/phases of the model. The four basic processes are the functional components of data-based program modification. They are listed in Table II-2 along with the focus and purposes of each process.

Structure

The relation of the four basic processes to the five program phases (and decision areas) can be seen by placing them in a two-dimensional matrix, as in Figure II-2. The resulting matrix contains 20 cells. Each cell identifies a process which must be carried out during a specific program phase. For each program phase, the specific process is translated into questions that the SERT attempts to answer. When all the questions have been answered the program modification for a student has been completed.

Table II-1

Data-Based Program Modification:

Program Decisions and Data-Gathering Processes

Decision Area (Question)	Data-Gathering Process
Problem Selection What are the problems that provided impetus for the referral and imply the need for program modification and special education service?	Initial Needs Assessment: 1. Determine who holds performance expectations for the child, 2. measure the current level and direction of the child's performance, 3. compute the discrepancy ratio between the performance expectations in the child's environment and the child's actual level of performance, 4. establish the importance rating (value) of the discrepancy.
Program Selection What program plan is likely to be least restrictive and yet effective in solving the referrer's problem(s)?	Program Planning: 1. Develop possible long- and short-range instructional goals related to discrepancy ratio, 2. plan alternative instructional strategies for achieving the goals, 3. recommend alternative administrative arrangements, 4. estimate time and resources necessary for attaining different goals using different modifications, 5. specify forces working for or against different modifications.
Program Operationalization Is the agreed-upon program modification being implemented as planned?	Implementation Evaluation (Intervention): 1. Appraise discrepancy between implemented program and planned program, 2. ascertain reasons for discrepancy if one exists, 3. propose alternative ways to reduce discrepancy between planned and implemented program.
Program Improvement Does the program modification as implemented appear to be moving us to problem solution?	Progress Evaluation (Intervention): 1. Appraise progress on short- and long-range objectives, 2. propose alternative revisions for programs that, apparently, are not affecting performance greatly.
Program Certification Were the problem(s) solved through program modification (intervention)?	Outcome Evaluation (Nonintervention): 1. Determine whether modifications have been successful in eliminating the discrepancies which led to initial referral.

Table II-2

Data-Based Program Modification:

Four Basic Processes

Process	Focus
Measurement	Student performance in relation to current environment: to provide an objective, precise, and quantitative description (data) for use in evaluation.
Evaluation	Decision making: to relate measurement data to values and people in making decisions during each program phase.
Communication Collaboration	Classroom teachers, parents, students, and involved professionals: to develop shared responsibility for identification and selection; plans for service; program progress; and program outcomes.
Consultation Training	Regular class teachers, aides, volunteers and peer and cross-age tutors: to develop, implement, and manage data-based program modifications for an individual or group.

The particular questions which have been identified have evolved out of using the matrix to train SERTs and to help them develop their resource systems. The questions have been modified many times and are likely to undergo further revision as the basic processes of DBPM are applied to the decisions which must be made during each phase of program modification. In the following chapters of this manual, the activities undertaken in each cell of the matrix to answer the requisite questions are set forth in detail.

The questions included in the matrix (Fig. II-2) are not exhaustive. In fact, we have included only those questions that highlight the activities essential to a particular cell. A more complete set of questions to be answered, materials needed, and action required to conduct DBPM are provided in Parts II-VI and in Appendix A.

SERT Competency

It is currently popular to identify what are referred to as teacher "competencies" when one describes what a teacher must be able to do to function in a given role. The term competency/performance-based teacher education (C/PBTE) is widely used to refer to training programs that are organized around what one is learning to do rather than topical content. Characteristically, in C/PBTE programs, training objectives are written in terms of those actions or performances which must be mastered in order to complete training. We have not found it necessary to write out a set of performance objectives related to each question generated out of our matrix for the teachers with whom we have worked. With the materials provided in Appendix A, it would be

DECISION AREA PROGRAM PHASE	PROCESS:			
	MEASUREMENT	EVALUATION	COMMUNICATION COLLABORATION	CONSULTATION TRAINING
PROBLEM SELECTION INITIAL ASSESSMENT	Is there a discrepancy between desired and actual performance ? • Are there desired performance expectations for academic and social behaviors? • What is referred student's baseline progress / performance in these academic and social behaviors? • What is the discrepancy?	Is the student eligible for service? • Have important discrepancies been identified? • Can a rationale be established for the importance of the problem? • Does student meet eligibility requirements?	Who owns the problem ? • Are the problems those the teacher; student; parent; others identify? • Are they shared problems? • Should others be consulted? • What are priorities?	Can the SERT help or train others to select problems for program modification? • Are there others who can be helped or trained to collect discrepancy data; conduct interviews; establish priorities and eligibility for service?
PROGRAM SELECTION PROGRAM PLANNING	How will effectiveness of program plan be measured ? • What graphs will be kept? • How often will data be collected?	What program plans are proposed ? • What resources are available? • What discrepancies have been identified? • What objectives and program changes are proposed?	Does the program plan meet the expressed needs of the referrer, student, parent, and other interested persons ? • Have all parties been involved in planning? • Have all parties accepted plan?	Can the SERT help or train others to select programs? • Are there others who can be helped or trained to propose alternative programs; write objectives; determine measurement procedures?
PROGRAM OPERATIONALIZATION IMPLEMENTATION EVALUATION	Is program being implemented ? • Is performance being measured ? • Are program changes being made? • Are graphs being kept for long range/daily objectives? • Are program changes noted on graphs and is data plotted?	Is program plan being implemented as proposed? • Are there a sufficient number of data points for each intervention? • Are program changes frequent enough?	Is program plan being implemented as expected by referrer, student, parent and other interested persons? • Are all parties aware of program modifications? • Are all parties satisfied?	Can the SERT help or train others to operationalize program plans? • Are there others who can be helped or trained to implement program; measure performance; evaluate extent to which program plan is being implemented as proposed?
PROGRAM IMPROVEMENT PROGRESS EVALUATION	What information is available on cumulative progress / performance to date? • Is there any information on the median level of performance/ average rate of progress for each intervention period? • Is there any information on trend and stability of performance during each intervention?	Is the program as implemented producing cumulative benefits for the student ? • Are there positive data trends? • Are there changes in discrepancies over initial assessment? • Were some program changes more effective than others?	Can information gathered on program changes be useful to others ? • Are all interested parties informed of progress? • Will future program changes be recommended?	Can the SERT help or train others to improve programs? • Are there others who can be helped or trained to evaluate progress; propose program changes; adjust programs?
PROGRAM CERTIFICATION OUTCOME EVALUATION	What is the present performance / progress discrepancy ? • What is the present trend of the data? • What are present discrepancy ratios?	Should the program as presently planned be terminated ? • Has program been successful in achieving objectives?/in reducing discrepancies? • Can others assume program responsibility?	Has program been successful in satisfying the needs of all interested parties ? • Are all parties aware of and satisfied with program outcome? • Do all parties feel program should be terminated?	Can the SERT help or train others to certify programs? • Are there others who can be helped or trained to evaluate if program should be terminated?

Fig. II-2. A matrix for guiding special education resource teacher (SERT) activities in data-based program modification. (S. Deno & P. Mirkin, University of Minnesota, 1976.)

relatively easy (though tedious) to do so, however,

In our work, we have taken the position that a SERT has satisfactorily completed training when he presents evidence of successful completion of at least six program modifications involving direct service for a target pupil, using the procedures outlined in the matrix. Additionally, the trainee is expected to present evidence of having consulted with and/or trained at least two other persons to implement the program modification sequence (see Part VII). Evidence is given in the form of case studies, which include graphed data.

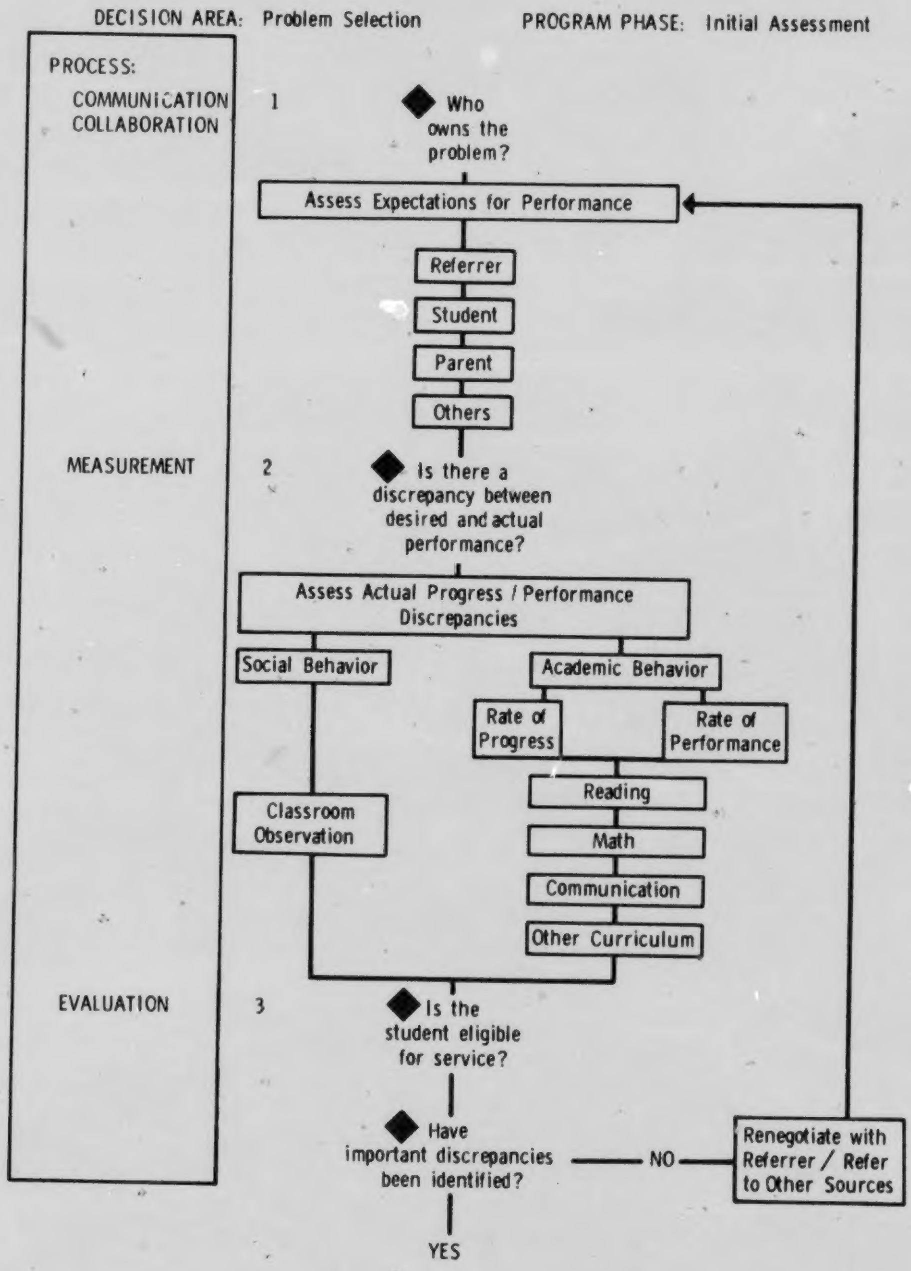
DECISION AREA: Problem Selection
PROGRAM PHASE: Initial Assessment
PROCESS:
COMMUNICATION COLLABORATION
1
Who owns the problem?
Assess Expectations for Performance
Referrer
Student
Parent
Others
MEASUREMENT
2
Is there a discrepancy between desired and actual performance?
Assess Actual Progress / Performance Discrepancies
Social Behavior
Academic Behavior
Rate of Progress
Rate of Performance
Reading
Math
Communication
Other Curriculum
Classroom Observation
EVALUATION
3
Is the student eligible for service?
Have important discrepancies been identified?
NO
Renegotiate with Referrer / Refer to Other Sources
YES

Fig. II-3. Activity flow chart, by decision area and program phase, I.

The Flow of Activities

The specific sequence of activities in which the SERT engages when he develops a program modification for an individual student (a case study) is shown in the successive flow charts (Figs. II-3, 4, 5, 6, and 7). Steps 4, 8, 12, and 16, which are omitted from the charts because they are consultation and training procedures, are discussed in Chapter XI.

The left-hand columns of the flow charts specify the order in which the matrix cells are implemented. During the initial assessment phase, communication and collaboration always precede measurement and evaluation. Program planning begins with evaluation and is followed by measurement and

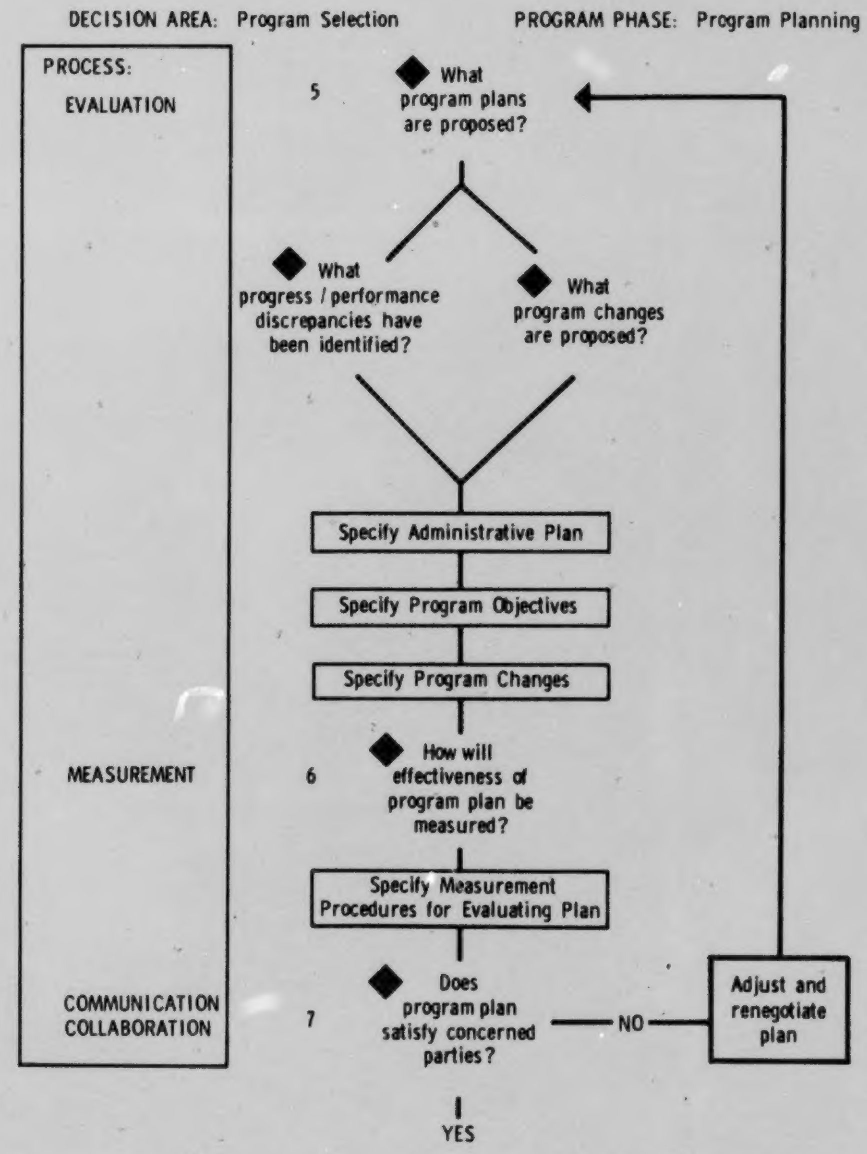
DECISION AREA: Program Selection
PROGRAM PHASE: Program Planning
PROCESS:
EVALUATION
5
What program plans are proposed?
What progress / performance discrepancies have been identified?
What program changes are proposed?
Specify Administrative Plan
Specify Program Objectives
Specify Program Changes
MEASUREMENT
6
How will effectiveness of program plan be measured?
Specify Measurement Procedures for Evaluating Plan
COMMUNICATION
COLLABORATION
7
Does program plan satisfy concerned parties?
NO
Adjust and renegotiate plan
YES

Fig. II-4. Activity flow chart, by decision area and program phase, II.

communication and collaboration. Measurement, evaluation, and communication and collaboration each follow in order during the other three program phases.

A general overview of the flow of these activities follows:

Decision Area:
Problem Selection

Program Phase:
Initial Assessment (Figure II-3)

This phase typically begins when a student is refered to the special education resource program by a classroom teacher. The classroom teacher fills out a referral form on which the problems precipitating the referral are specified briefly and concisely, and the discrepancy between student performance and classroom expectation is described. Procedures are initiated for the SERT to interview the teacher, parent, and student. Priority-ranking forms are completed and specific academic and social behaviors are measured to establish an objective basis for defining the problems(s) specified in the referral.

If social and academic assessments are required, they are directed to specified areas of difficulty in the school curriculum rather than to generalized patterns of disability. The

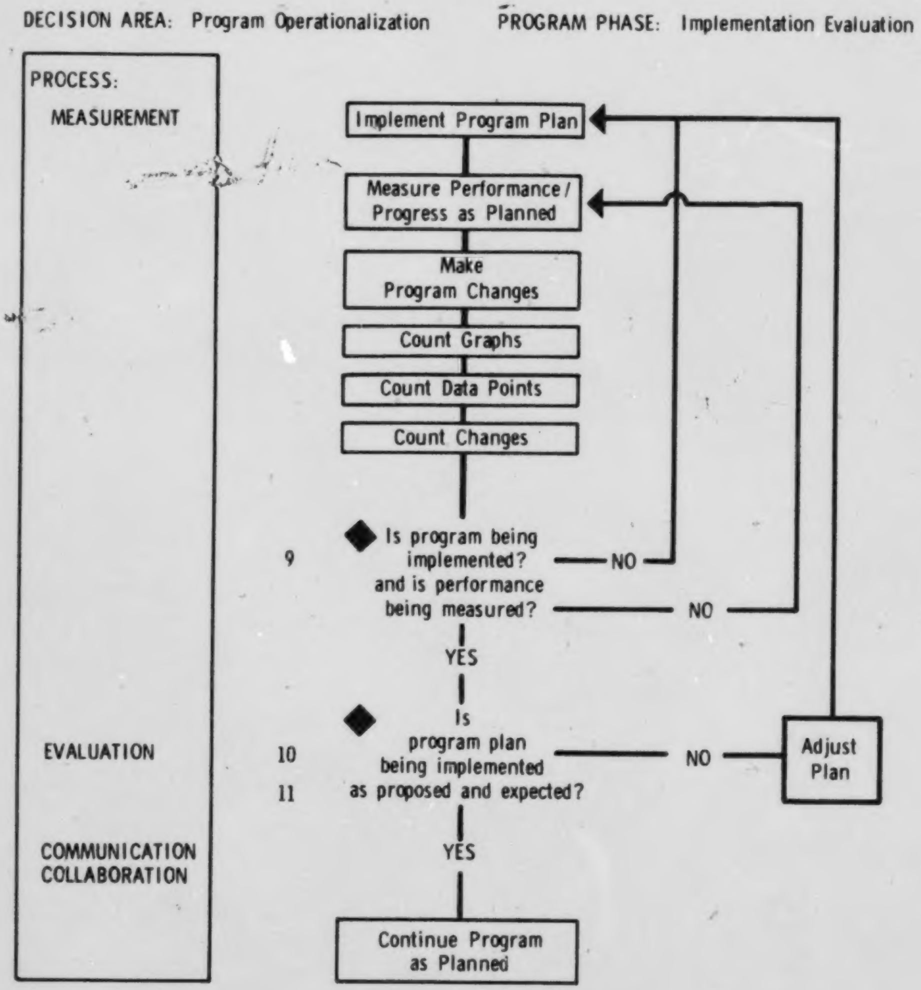
DECISION AREA: Program Operationalization
PROGRAM PHASE: Implementation Evaluation
PROCESS:
MEASUREMENT
EVALUATION
COMMUNICATION COLLABORATION
Implement Program Plan
Measure Performance/ Progress as Planned
Make Program Changes
Count Graphs
Count Data Points
Count Changes
9
Is program being implemented? and is performance being measured?
NO
NO
YES
10
11
Is program plan being implemented as proposed and expected?
NO
Adjust Plan
YES
Continue Program as Planned

Fig. II-5. Activity flow chart, by decision area and program phase, III.

important assumption on which the assessment is based is that it is the child's performance on mainstream tasks which results in his being viewed as successful or unsuccessful by the teacher. The child who fails to function typically on these tasks is considered by the teacher to have a problem. Diagnosis within the context of the mainstream curriculum consists primarily of determining the child's current level of proficiency on particular parts of the curriculum.

In reading, for example, in what book and on what pages can the child currently read at an acceptable level of correctness, with an acceptable level of comprehension, and what are the expectations for this child? It is assumed that any individual program, to be successful, must begin by determining where the child is and move him from that point as rapidly as possible. Diagnosis of this type has the considerable advantage of placing the child within an instructional

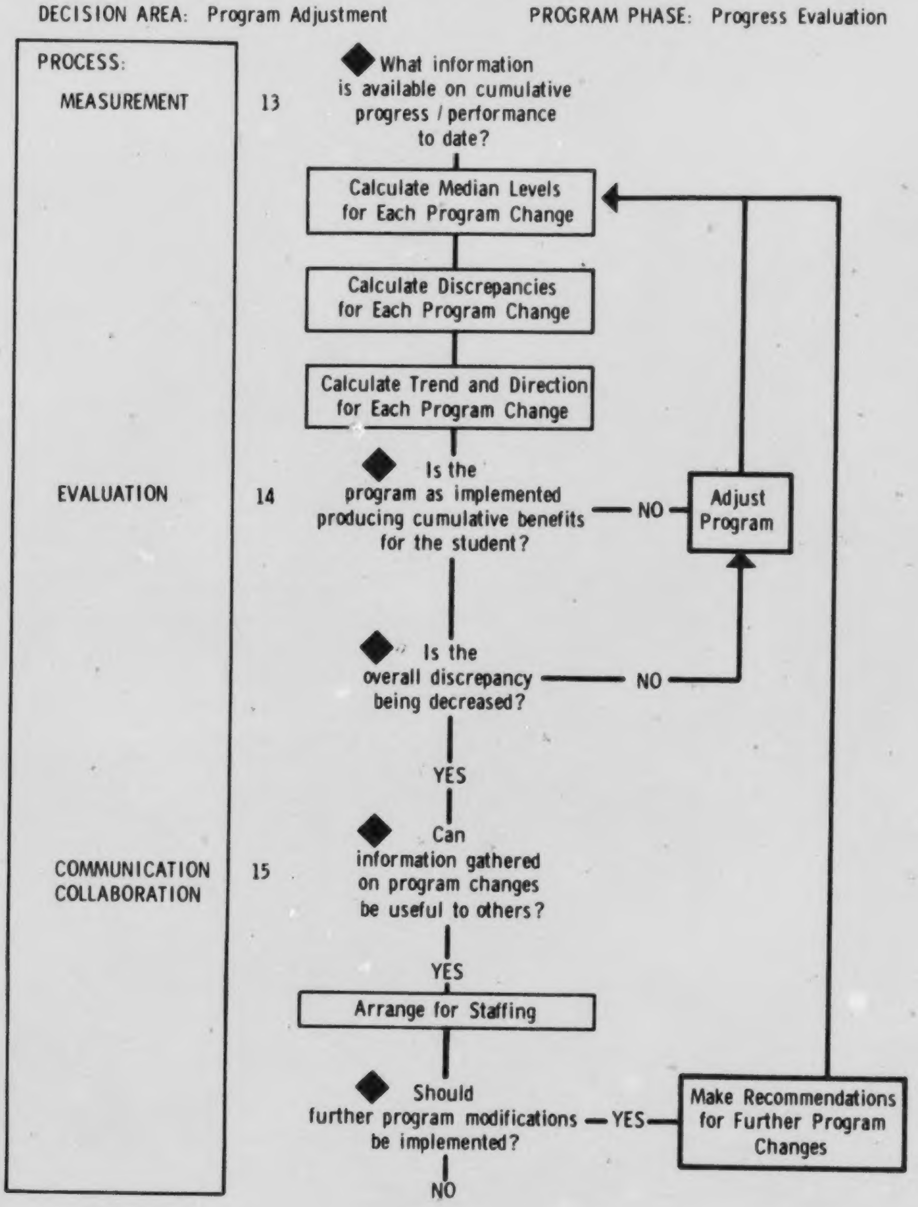
DECISION AREA: Program Adjustment
PROGRAM PHASE: Progress Evaluation
PROCESS:
MEASUREMENT
13
What information is available on cumulative progress / performance to date?
Calculate Median Levels for Each Program Change
Calculate Discrepancies for Each Program Change
Calculate Trend and Direction for Each Program Change
EVALUATION
14
Is the program as implemented producing cumulative benefits for the student?
NO
Adjust Program
Is the overall discrepancy being decreased?
NO
YES
COMMUNICATION COLLABORATION
15
Can information gathered on program changes be useful to others?
YES
Arrange for Staffing
Should further program modifications be implemented?
YES
Make Recommendations for Further Program Changes
NO

Fig. II-6. Activity flow chart, by decision area and program phase, IV.

DECISION AREA: Program Certification   PROGRAM PHASE: Outcome Evaluation

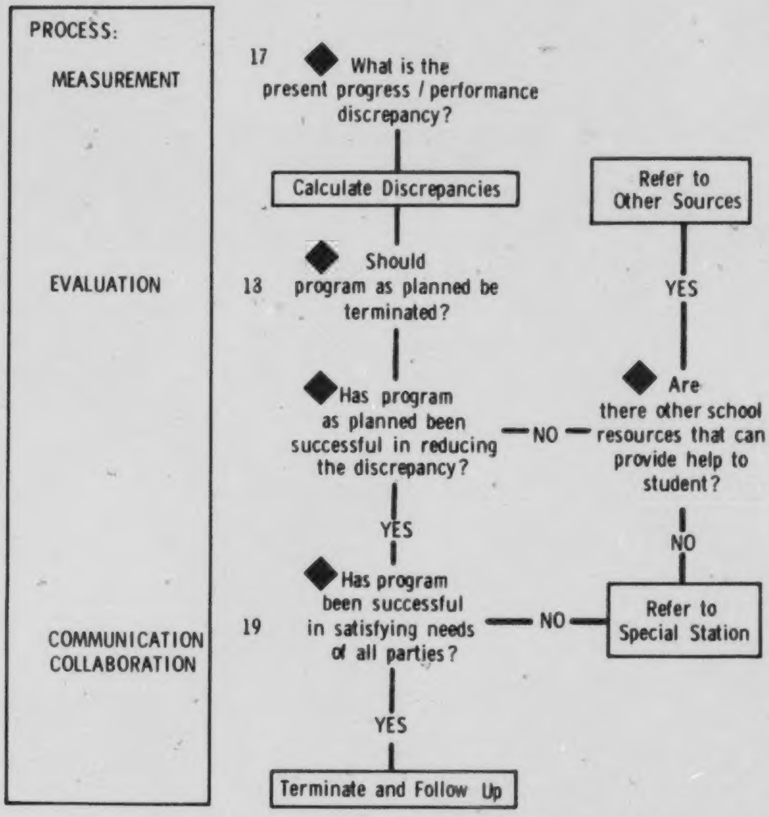
PROCESS:
MEASUREMENT
EVALUATION
COMMUNICATION COLLABORATION
17
What is the present progress / performance discrepancy?
Calculate Discrepancies
Refer to Other Sources
13
Should program as planned be terminated?
YES
Has program as planned been successful in reducing the discrepancy?
NO
Are there other school resources that can provide help to student?
YES
NO
19
Has program been successful in satisfying needs of all parties?
NO
Refer to Special Station
YES
Terminate and Follow Up

Fig. II-7. Activity flow chart, by decision area and program phase, V.

materials sequence and, at the same time, of reducing the hiatus between diagnosis and remediation, which is so troublesome in special educational interventions. The process involved is a direct extension of the kind of "mastery learning" formulation articulated by Bloom (1968).

The entire formulation fits neatly with the notion that the problem is not a condition residing within the child; rather, the problem is the discrepancy that exists between the child's actual performance and the performance desired from him. The discrepancy between the student's probable level of mastery and age and grade-level expectations, or "normative" performance, is noted. Evaluation decisions revolve around agreement on what the problems are, how important are they, and is the child eligible for special education service. The decisions are based on the discrepancy data which are gathered and the priorities which are established by the persons involved (including the child and parents).

Decision Area:
Program Selection

Program Phase:
Program Planning

(Figure II-4)

The program-planning phase involves agreeing upon a written plan that specifies (a) long- and short-range instructional goals and procedures for measuring progress on goals, (b) teaching strategies (hypotheses) which will be tried (operationalized) in an effort to reduce identified performance discrepancies, and (c) administrative arrangements to be used.

An important role played by the SERT during program planning is the development of alternatives for all parts of the program plan so that the decision makers (including the SERT) are, in fact, choosing among alternatives rather than just ratifying the SERT's decision. To ensure collaboration, each person concerned with the student's program and progress is asked to review the proposed alternatives and to indicate approval or to offer suggestions for change/improvement. The plan is developed by the SERT who is responsible for circulating the written plan and negotiating any proposed modification.

(Figures
II-5
II-6)

Decision Areas:

Program Operationalization
Program Adjustment

Program Phases:

Implementation Evaluation
Progress Evaluation

During the implementation and progress evaluation phases, attempts are made to insure that the planned program is carried out as intended and that the projected progress is being made. The rate at which goals are achieved determines whether alterations or adjustments in the student's program must be made. Evaluation during this phase is formative--intended to form or improve the program. Judgments of skill acquisition are based on predetermined criteria for mastery and stated objectives. Data are taken daily or weekly and graphically represented on daily, weekly, and monthly graphs (see following chapters) to evaluate the effectiveness of alternative strategies. Forces operating against effective implementation of the program are identified and alternatives are discussed. Other persons are identified for training in implementing and adjusting the program plan.

(Figure II-7)

Decision Area:

Program Certification

Program Phase:

Outcome Evaluation

Decisions regarding program termination for a student are evaluated in terms of the extent to which the stated discrepancies have been reduced, other service is available, and the referrer has been satisfied. Recommendations are made to those persons to whom future responsibilities have been assigned. These recommendations are based on the data which have been collected throughout the program.

Development of Resource Systems

Data-based program modification provides the conceptual framework for the development of resource systems for schools and school systems as well as for individual students. When the resource system is being organized to improve programs for an individual student, the focus is on the discrepancies between the student's academic and social development and the expectations for his development which are held by people who occupy significant places in the student's life space. Programs are planned, implemented, and adjusted to reduce measured discrepancies. The effect of the program modifications in reducing the discrepancies is continually monitored and evaluated. When performance discrepancies have been reduced to the point at which they no longer are considered to be important, program modification can be certified as complete or successful.

When data-based program modification is used to organize a resource system for a school's special education program, the focus is on the discrepancies between the special education program as it presently operates and the desired operation of the program, as identified by persons who occupy a significant place in the life of the school system. Once the discrepancies between what the program does and what it should do have been identified, plans are formulated to reduce

Table II-3

Data-Based Program Modification:

Summary of Salient Features

1. The student's academic and social behavior is always assessed in relation to the regular classroom as organized by the teacher and acted on by his peers, and to explicit expectations for performance (by teachers, parents, and school).

2. The importance of the "problem" (i.e., the discrepancy between expectation and actual student performance) is determined through interpersonal negotiations among concerned parties (i.e., student, parents, professionals), and the actual observation of academic and social behaviors on the priorities which have been established in these negotiations.

3. Intervention plans are developed consistent with the doctrine of "least restrictive alternative" and the right to due process.

4. Special educational interventions (program changes) are evaluated; systematic attempts to obtain cumulative benefits occur through making progressive modifications in the physical environment, instruction, and motivation.

5. Programing recommendations focus on "what works" for the individual child and content validity is obtained by making the diagnostic process and the teaching process the same.

6. Programs are made responsive to changes in performance through frequent reviews and evaluations. Decisions are data-based.

7. Because evaluation of student progress is based on the summation of changes in performance on curriculum tasks, it is possible to determine if the special intervention is more successful than the regular program in reducing the discrepancy between student performance and expectations.

these discrepancies. Measurement procedures are devised to evaluate the extent to which the plans are implemented as well as the progress in achieving the agreed-upon goals. When program discrepancies are reduced to the point at which they are no longer considered important, the resource system has been successfully developed. Although exploration of this aspect of data-based program modification is not the purpose of this book, it has been described generally to emphasize the wide-ranging applications of the DBPM decision-making framework.[1]

If resource systems are to function effectively in support of teachers and children, the persons responsible for their development and management must learn to understand and use a systematic decision-making process. Data-Based Program Modification, as it is conceptualized in the matrix (Fig. II-2), provides a decision framework for developing resource systems and for operating within these systems. Table II-3 summarizes the salient features of DBPM.

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[1] The Center for the Study of Evaluation at U.C.L.A. has developed materials that explore this aspect of system development.

References

Bloom, B.S. Learning for mastery. *Evaluation Comment*, 1968, *1*(2).

Klein, S., Fenstermacher, G., & Aiken, M.C. The Center's changing evaluation model. *Evaluation Comment*, 1971, *2*(4), 9-12.

Chapter III

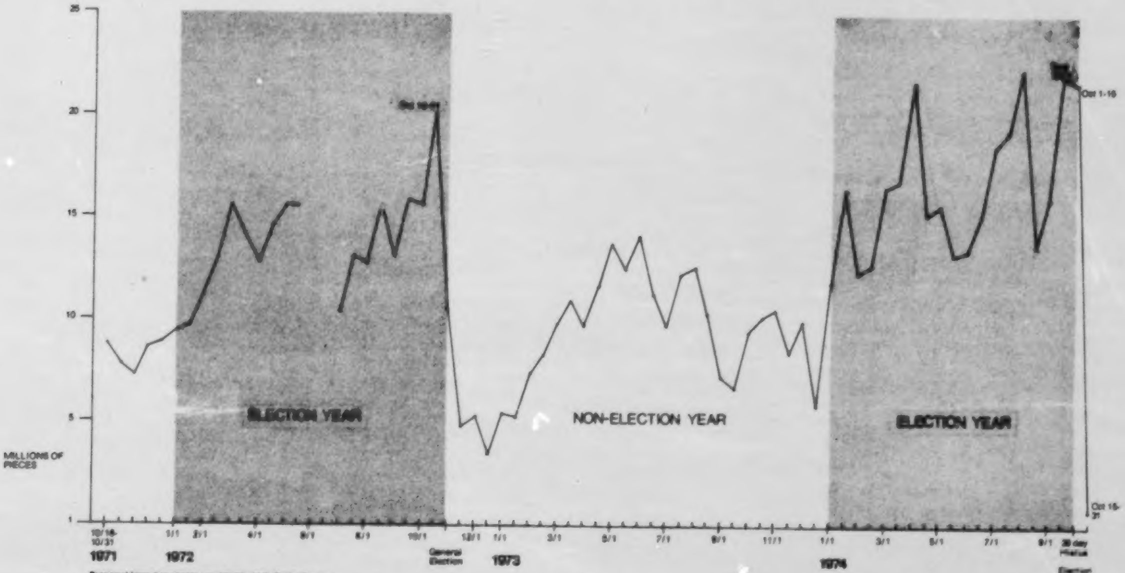
THE MEASUREMENT AND EVALUATION PROCESSES

Time Series

What makes the program modification system "data-based" is the application of time series research procedures to student performance under different instructional conditions. When appropriately applied, time series research permits reasonable conclusions to be drawn about the relation between the changes in a student's program and the changes in his progress. These measurement and evaluation processes are central to DBPM.

The kind of time series data which SERTs collect to monitor pupil performance is the same as that used in the functional analysis of behavior by behavioral psychologists to evaluate the effects of changing reinforcement contingencies. Time series data are also collected by highway departments to monitor accident rates, police departments to monitor crime rates, health organizations to monitor disease incidence, and physicians to monitor vital signs. The application of time series research designs to performance is an analytic procedure which can be used whenever information on events occurring over time is desired.

A simple illustration of the application of a time series is presented in Figure III-1. The data graphed are the millions of pieces of franked mail sent out by U. S. congresspersons during two election years and the intervening nonelection year. From the graph, certain information can be derived, such as, (a) volume of franked mail is greater during election than nonelection years; (b) volume of franked mail is greater in the election years between general elections: and (c)



Prepared from documents provided by U.S. Postal Service
**The figures for this period were not available when chart was prepared.

Fig. III-1. Use of franked mail by U.S. congressmen during two election and one nonelection years. Source: *Common Cause Report*, 5(7), 1975, 8.

volume of mail is greater in the fall of election years and the summers of nonelection years. The third item of information is possible because the time series shows the changes in volume of mail over the months of each year. Taken together, the information yields the conclusion that the amount of franked mail a congressperson sends out is determined by the imminency of elections. This conclusion is validated by the repetition of the election year pattern.

In typical programs in schools, students are tested at the beginning and end of instructional sequences. Under such conditions, it is not possible to draw conclusions about the relation of changes in the instruction to changes in student performance. Campbell and Stanley (1963) referred to research using pre-post testing as a "bad example" that does not permit reasonable conclusions to be made about the effects of changes because other plausible explanations for what is observed cannot be ruled out.

In our chart of franked mail, for example, we can see how pre-post testing effects interpretation. Suppose we were to compare volume of mail on the same date in election and nonelection years. If that date were June 1, our comparison would indicate that the volume of mail was greater in 1973 than in 1974, and we would have to conclude that elections have no influence on volume. However, if we chose September 1 as the comparison date, our conclusion unquestionably would be the opposite. Obviously, time of administration strongly influences the results of pre-post testing.

In Figure III-2, other examples are given of the invalid conclusions that are promoted by the use of pre-post testing. The graphs show the performances of four different students who have been referred to a SERT for individual instruction in oral reading. Each graph represents the trend of a child's rate of reading the local newspaper before and after SERT intervention; testing occurred at the points indicated by "pre" and "post."

In each graph, posttest oral reading rate is higher than pretest oral reading rate. Using just the pre- and posttest scores, the clear (and correct) conclusion is that in each case SERT intervention increased oral reading rate. However, if we used the information on student growth that was obtained through frequent testing, we would see clearly that in only two cases (C and D) did SERT intervention actually improve the child's growth in oral reading rate. SERT intervention appears to have had no effect on child A's growth and actually to have decreased the growth rate for child B. The depiction for child A is a special problem when evaluating special education interventions because growth is characteristic of all children, and pretesting-intervention-posttesting will result virtually always in the measurement of growth which should be attributed to developmental factors rather than instructional intervention.

In addition to evaluating specific program effects, time series analysis enables us to see what is happening to child performance while the program is in progress, and to distinguish planned

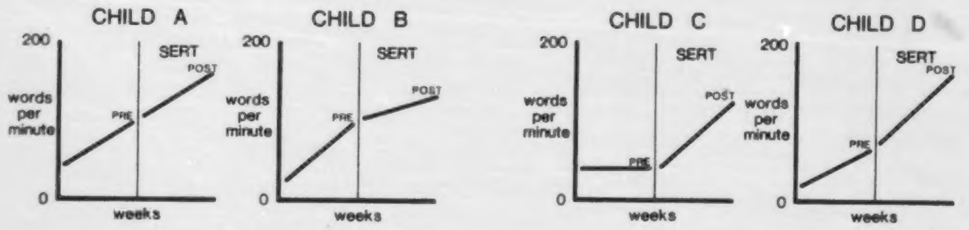


Fig. III-2. Performance graphs of four students in reading, before and after intervention.

from unplanned effects. For example, a program modification for one child may have all its effects during the first week of intervention and none thereafter; for another child, a program modification may never affect performance. Thus, time series analysis enables us to observe the form of the program modification over time. Posttests, usually scheduled at the teacher's discretion, may require the student to practice a task long after he has achieved mastery; or the student may be subjected too long to a neutral or negative treatment.

DBPM requires the special education teacher to function as an applied scientist, that is, to test hunches (hypotheses) about what might help the student improve his performance, and to make instructional decisions on the basis of objectively determined effects rather than subjectively formed speculations. Thus, the special educator is not required to function as a "trapped administrator" who must try to predict with certainty whether a specific program will be effective for a specific child. Instead, the special educator introduces (hypothesizes) a program, carefully monitors (tests) the child's performance and progress in the program, records the obtained data on graphs, and alters the program (forms a new hypothesis) in the ways that seem indicated to optimize the child's progress.

Continuous Feedback: Charting Program Effects

The key or central element of successful DBPM is the graphed record of student development. A graph of observed development over time (time series data) provides the information that is needed to make critical decisions about the student's movement from past to present status in his program of instruction. Further, it affords some basis for predicting future development under different instructional, incentive, and/or administrative arrangements. In the long run, the graphed relation between changes in the student's development and changes in the program provides the data base for making evaluative judgements about special education intervention.

In DBPM, two basic graphs are used to display daily, weekly, and monthly data:

1. Progress (or Mastery) Graphs.
2. Performance Graphs.

Progress (or Mastery) Graphs

A progress (or mastery) graph is constructed to display the time it is taking a student to master a set (usually, ordered over time in terms of sequence and/or complexity) of instructional objectives. In constructing the graph, the series of objectives the student is working on is shown on the ordinate (up the left side) along with the time in which the objectives are expected to be achieved, and the time--days, weeks, or months--during which the student is working on the objectives is shown on the abscissa (across the bottom). A point is plotted at the intersection of the relevant vertical time line and horizontal objectives line when mastery has occurred. Points are plotted sequentially and connected; the result is a line showing the one-to-one relation between time of mastery and time in school.

The progress graph can be used in any classroom where or program in which specified tasks to be mastered can be identified in relation to time. The tasks may be objectives that are independent of any particular curriculum, or they may be requirements imbedded within a particular curriculum sequence. In the objectives-based approach, where the tasks are independent of a particular curriculum, the sequence of objectives to be attained and the time allotted for attainment are laid out on the ordinate, and the days, weeks or months of school attendance are listed on the abscissa. In the specific curriculum and curriculum-sequence approach, the abscissa is

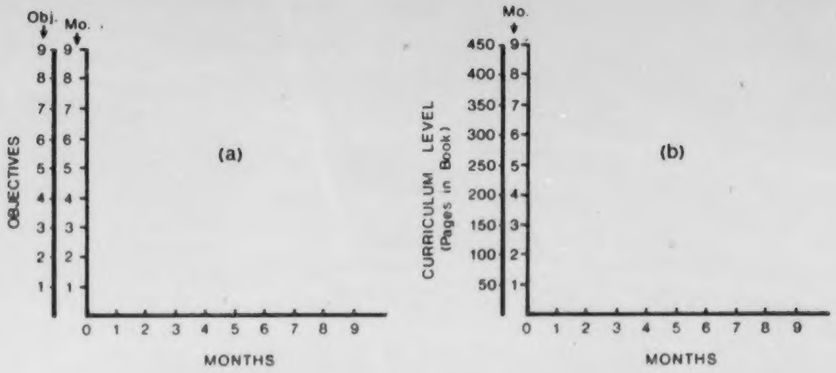


Fig. III-3. (a) A progress graph organization for an ordered sequence of objectives. (b) A progress graph organization for an established curriculum in reading.

also labeled for time in school by days, weeks, or months and the ordinate shows the curriculum sequence and the time allotted for attainment of each item of the sequence. Figures III-3(a) and (b) illustrate the graph organizations for the two approaches.

In both approaches, the graph is a square drawn on equal-interval paper. On both axes, the equal number of equally spaced squares are marked to represent equal time periods. On the vertical axes, the number of tasks are spaced according to the time of mastery expected of average students in this curriculum. Thus, the graph is organized so that for the average student the level of progress (mastery) is one to one: For each week, month, or year in the program the average student is expected to master the number of tasks designated for that week, month, or year. If achievement of average students is plotted week by week, month by month, and year by year, the line connecting these points is a diagonal from the lower left corner to the upper right corner of the graph.

For the target student, the progress level usually differs from the one-to-one ratio because, typically, he has not achieved a week's, month's, or year's progress in the designated time period. Thus, when the target student's mastery level is plotted on the graph, the discrepancy between his progress and that of average students is graphically illustrated by the distance of his progress points from the diagonal line of average progress.

Performance Graphs

A performance graph is designed to display how a student's behavior changes *on a single task*, such as "oral reading from an age/grade appropriate reader" or "off-task behavior during work time," over time. On the performance graph, the abscissa again shows the time in days, weeks, or months of the program during which measurements are made. The ordinate simply shows the level of performance on that single task on a day when that performance was measured. Thus, in Figure III-4 (a), the ordinate (vertical axis) shows the number of words read correctly and incorrectly per minute; and in Figure III-4 (b), the ordinate shows the number of off-task behaviors per minute during work time.

Either equal-interval or equal-ratio graph paper can be used in developing performance graphs, depending on which is preferred or more useful. In both forms the vertical lines represent calendar dates. On equal-interval graph paper, the equally spaced horizontal lines can be designated to represent a number, percentage, or rate (frequency). On equal-ratio graph paper,

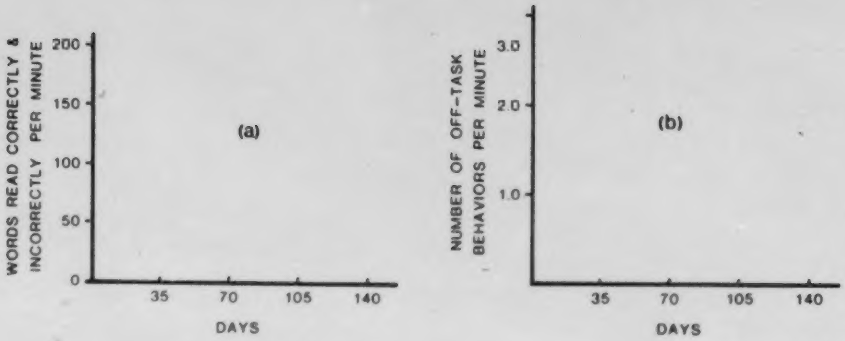


Fig. III-4. (a) A performance graph for "oral reading from age/grade appropriate reader." (b) A performance graph for # of off-task behaviors.

the horizontal lines are so drawn that performance changes which are proportionately equal are visualized as equal. Since a change in behavior from 2 to 4 is a "two times" increase (i.e., 2 x 2=4), it is shown as equal to a change in behavior from 50 to 100, which is also a "two times" increase (i.e., 2 x 50=100).

Equal-ratio graph paper is semilogarithmic (multiply and divide) rather than additive and has been popularized through Precision Teaching as the Standard Behavior Chart (Pennypacker, Lindsley, & Koenig, 1972). What is often obscured in discussions over the relative merits of equal-interval and equal-ratio graph paper is that both display the results of regular and frequent measurement of student performance over time. Both are designed to permit analysis of time series data. The only real difference between the two is that equal-interval graph paper emphasizes absolute differences and equal-ratio graph paper emphasizes relative differences.

Choosing the Right Graph

Whether you use a progress (mastery) graph or a performance graph depends solely on the kind of data you wish to use as the basis for program modification decisions. If the rate at which a student is mastering a set of tasks is important, then a progress graph is most useful. If changes in level of performance on individual tasks aremore important, then performance graphs are likely to be most helpful. Many SERTs with whom we have worked develop and maintain both kinds of graphs because they are interested in both kinds of data. Since the "grade equivalent"/"grade level" score is widely used in school programs, to maintain communication it may be most useful to represent student development on progress graphs for school staff and parents.

Listed in Figure III-5 are some examples of behaviors which can be charted on performance and progress graphs. Note that the level of specificity in the examples increases with the frequency of measurement.

Abscissa. The choice of time period for the construction of the graph depends upon the length of the curriculum and the pinpointed behaviors. Typically, at the elementary level, monthly progress and daily progress and/or performance graphs are kept on an individual student for reading and other basic skill areas. Additional graphs may be kept on various aspects of social behavior.

Monthly progress graphs can be constructed to span time periods of any length, although a period of an academic year is usually best. At the elementary level, where reading programs usually begin in the first grade and continue through the sixth, a 6-year monthly progress graph

	Progress			Performance		
	Monthly	Weekly	Daily	Monthly	Weekly	Daily
Reading	Cumulative books completed in basal reading series	Cumulative stories completed in basal series Book A	Cumulative pages completed in basal reading series Book A	# of Words read per minute in newspaper/ magazine	# of Words read per minute in grade-level reading material	# of Words read per minute in Book A
	Cumulative library or paperback books read	Cumulative chapters completed in book each week	Cumulative pages completed in book each day	# of Words read per minute in grade-level reading material	# of Words read per minute from Dale Chall word list	% of Comprehension questions answered correctly
Math	Cumulative units completed in math curriculum	Cumulative objectives completed in math curriculum	Cumulative worksheets completed in math curriculum	% (or # of) Word problems completed per minute	% (or # of) Computation problems completed per minute	% (or # of) Math facts written correctly per minute
Social	Cumulative contracts completed	Cumulative contract objectives achieved	Cumulative daily objectives achieved	# of Times raises hand during class discussion	# of Assignments completed	# of On-task behaviors per minute

Fig. III-5. Examples of the types of data which can be plotted on progress and performance graphs.

can be constructed for the entire program; if the reading program begins in kindergarten, the monthly graph can be extended to record progress over the 7-year period.

At both the elementary and, particularly, the secondary level, monthly progress graphs can be constructed for curricula of any length, depending on how many years each curriculum spans. For example, if a science curriculum were to include General Science (1/2 year), Biology (1/2 year), and Physics and Chemistry (2 years), the monthly progress graph for the entire curriculum would span three years. If you considered it necessary, you could make up a progress graph of the appropriate time period (1/2 year or 2 years) for any part of the curriculum. In the same way, if a math program were to extend over two years, the monthly progress graph would be constructed for that period.

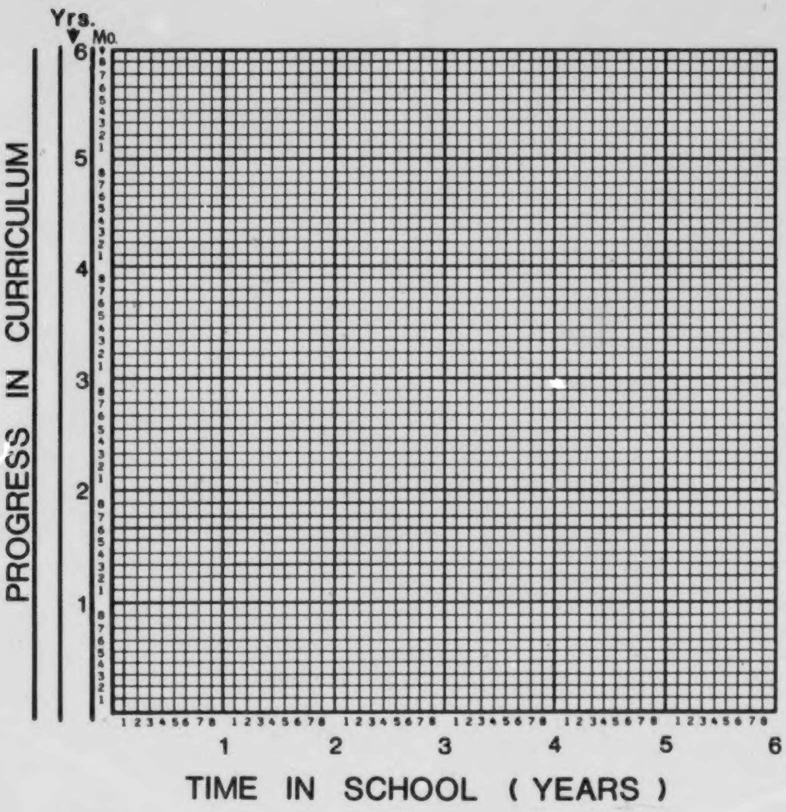
Graphs to record weekly or daily rates of progress and performance work best when they are limited to periods of one school year or less.

Rates of progress graphs for different time periods are shown in Graphs 1-5. Graphs 1 and 2 show monthly rate of progress, the first for a 6-year curriculum, the second for a 7-year curriculum. In each graph, note that each horizontal and vertical line represents one month, and every ninth line represents one year. Graphs 3 and 4 are weekly progress graphs, the first for a curriculum of one school year, the second for a curriculum of 12 weeks. In each graph, each vertical and horizontal line represents one week. Graph 5 shows daily rate of progress for 98 days; thus, each horizontal and vertical line represents one day of school.

Examples of performance graphs are shown in Graphs 6 and 7. Both span periods of 140 days, approximately one half of a school year, including Saturdays and Sundays.

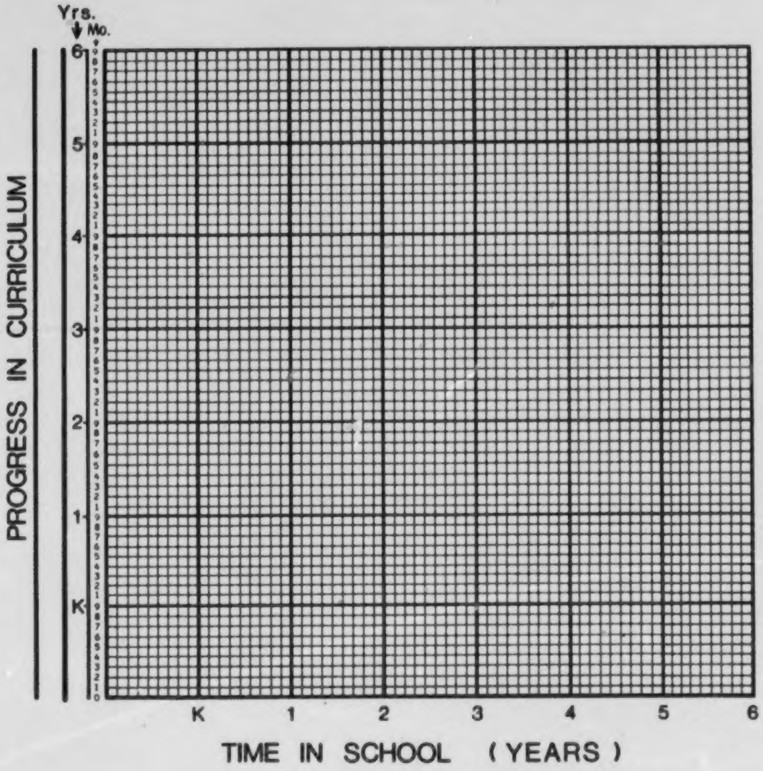
Although frequent monitoring and graphic display can be used for any student by any teacher, they are an essential element in the modification of programs for children whose development is significantly different from their grade-age peers.

STUDENT:
SCHOOL:
CURRICULUM:



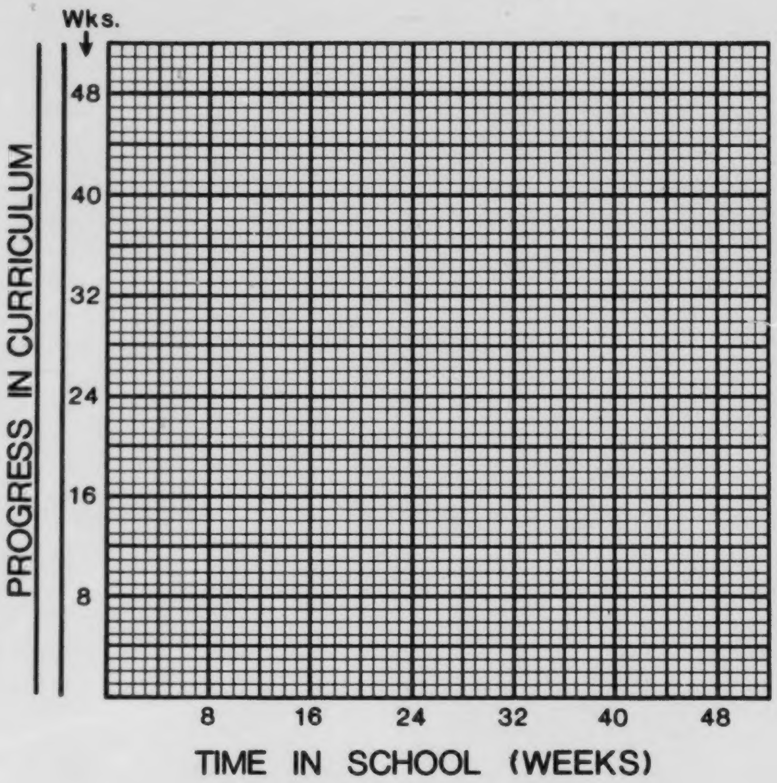
Graph 1. Yearly progress graph by months, 6-year curriculum.

STUDENT:
SCHOOL:
CURRICULUM:



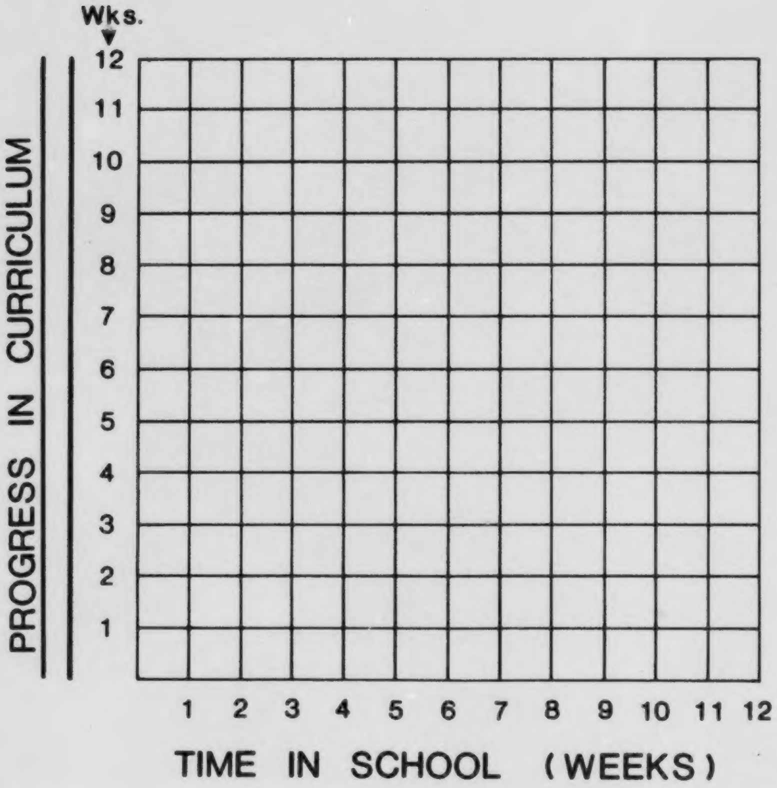
Graph 2. Yearly progress graph by months, 7-year curriculum.

STUDENT:
SCHOOL:
CURRICULUM

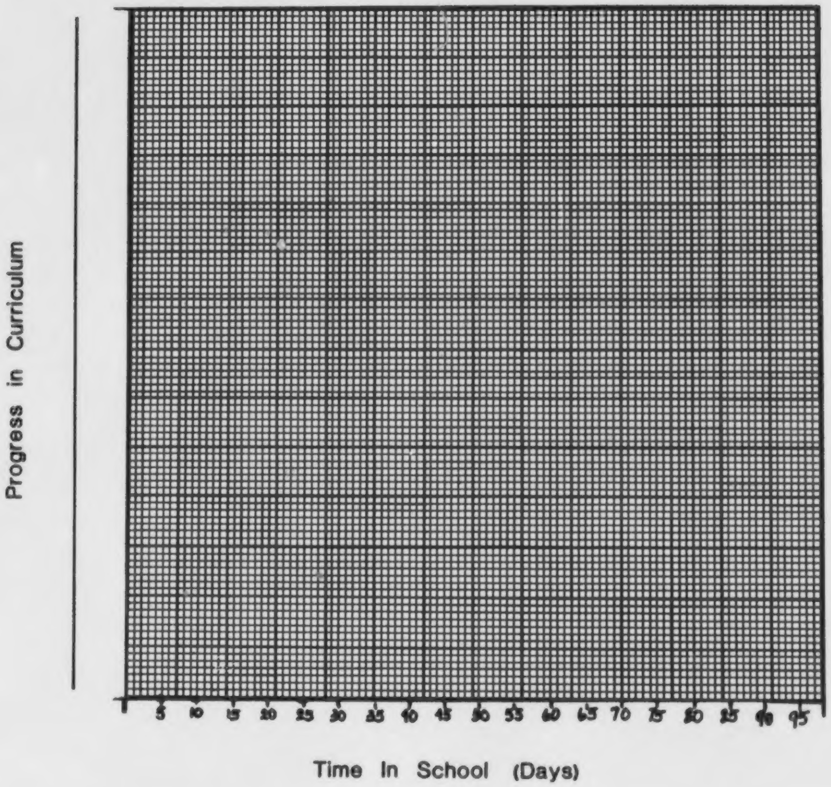


Graph 3. Weekly progress graph for one year; one-year curriculum.

STUDENT:
SCHOOL:
CURRICULUM:



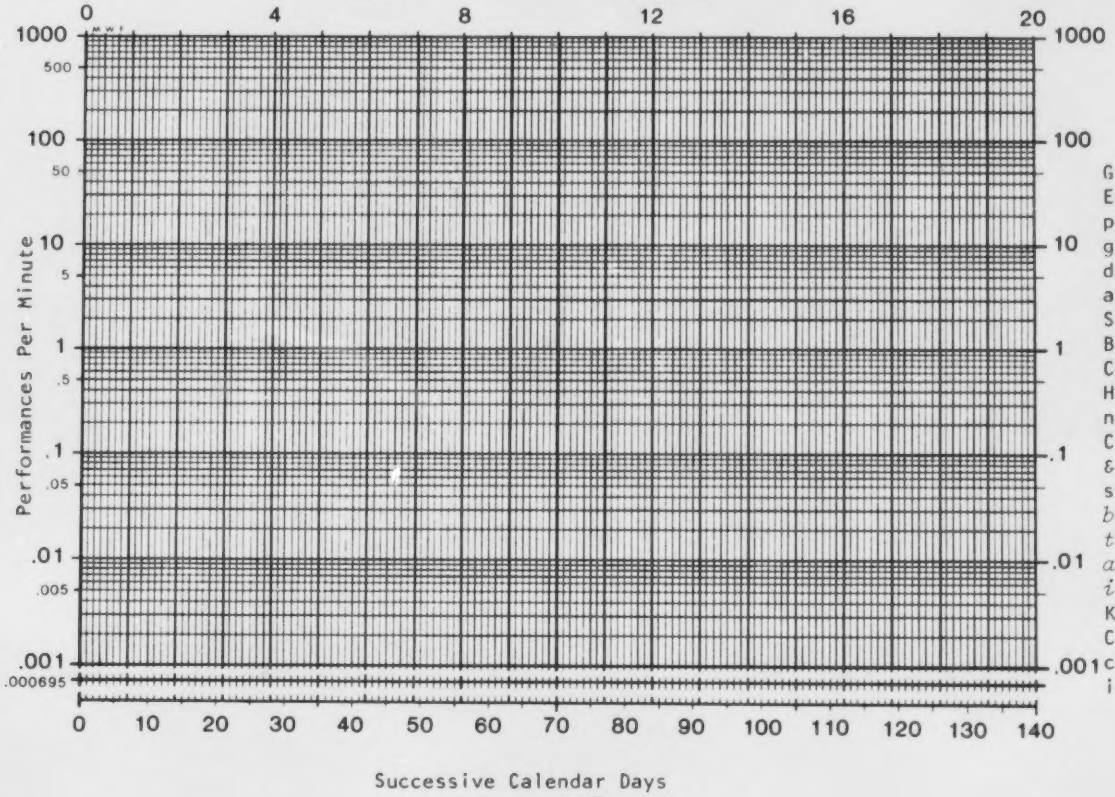
Graph 4. Weekly progress graph; 12-week curriculum.



STUDENT:
SCHOOL:
CURRICULUM:

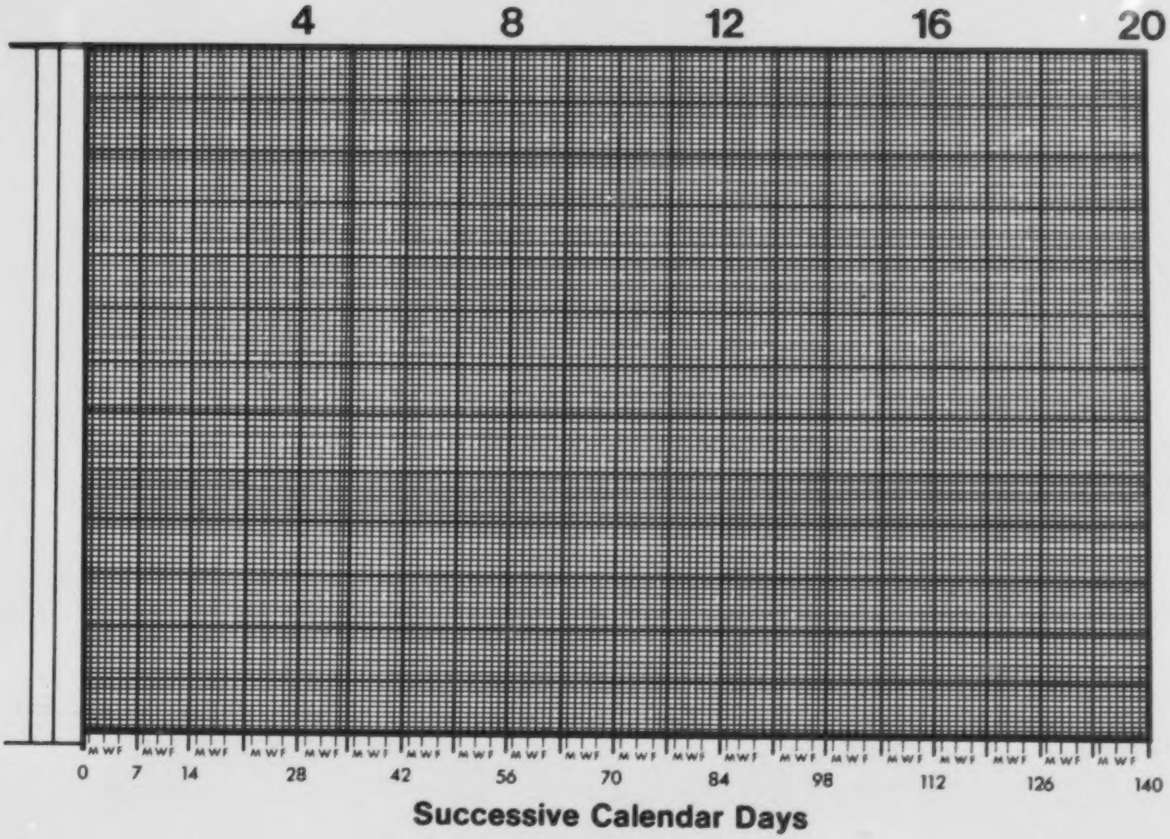
Graph 5. Daily progress graph, 98 days.

STUDENT: SCHOOL: CURRICULUM:



Graph 6. Equal-ratio performance graph, 140 days. (Adapted from Standard Behavior Chart in H.S. Pennypacker, C. Koenig, & O.R. Lindsley, *Handbook of the Standard Behavior Chart*, Kansas City: Precision Media, 1972.)

STUDENT:
SCHOOL:
CURRICULUM:



Graph 7. Equal-interval performance graph for a pinpointed behavior for 140 days, 20 weeks. (Developed for the Seward-University Special Education Project, USOE #0-71-4155(603).)

Discrepancy Measurement and Progress Estimates

Before a SERT modifies a program for a referred student, the following two items of information must be obtained:

1. The discrepancy between the target student's progress/performance and desired progress/performance as determined by teachers and peer sampling.
2. An estimate of the progress which is required for the target student if the discrepancy is to be reduced within a specified time interval.

This information is the basis for problem and program selection decisions.

Which progress and performance discrepancies are determined depends upon the curriculum of the referred student's school and the behaviors which have been identified as important in the initial referral and subsequent interviews.

1. When mastery of a set of tasks (sequenced or not) has been established as the behavior of concern (which is common when definite expectations have been set at each grade level), then discrepancy in progress is determined.
2. When degree of proficiency on a single task (i.e., how well the student reads, writes, or computes) is the concern, then discrepancy in performance is determined.

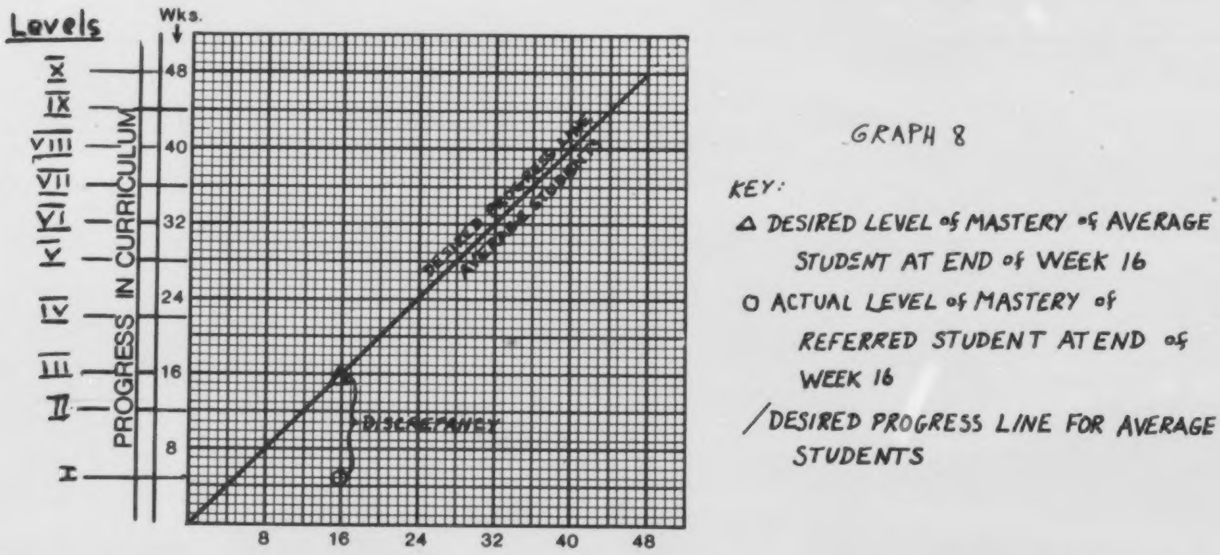
Discrepancies can be described visually or numerically.

Describing Discrepancies Visually

On a progress or performance graph, it is possible to illustrate visually the discrepancy between the referred student's progress or performance and that of his peers who are progressing or performing consistent with cultural expectations and, hence, are considered to be "average."

The weekly progress graph shown in Graph 8, for example, visually illustrates the discrepancy between desired mastery level for average students on a set of math categories and the referred student's actual mastery level on the same set of categories.

STUDENT: SCHOOL: CURRICULUM: Math



GRAPH 8

KEY:

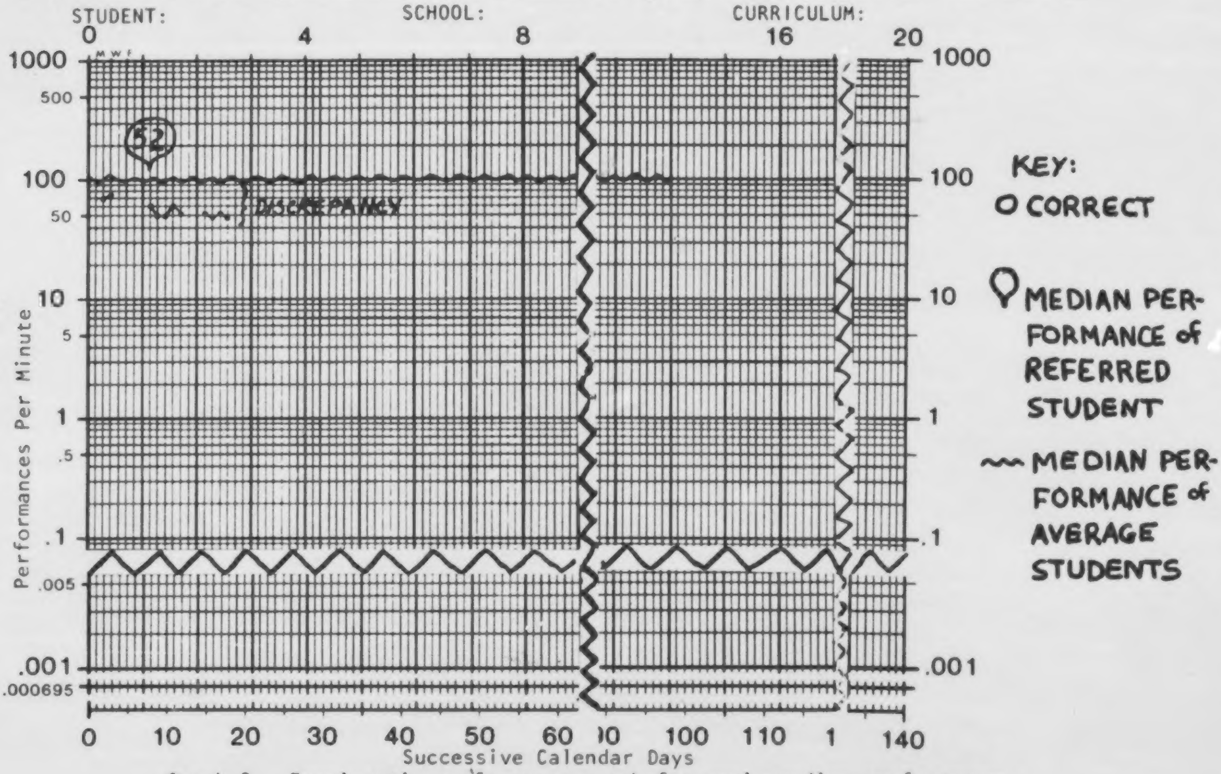
△ DESIRED LEVEL of MASTERY of AVERAGE STUDENT AT END of WEEK 16

O ACTUAL LEVEL of MASTERY of REFERRED STUDENT AT END of WEEK 16

/ DESIRED PROGRESS LINE FOR AVERAGE STUDENTS

Graph 8. Weekly rate of progress graph in a curriculum for one year of school: Math.

The daily performance graph shown in Graph 9 is a visual representation of the discrepancy between the number of words read per minute in a textbook by average students and the number read per minute by the target student. (For reasons of space, the graph has been cut down.)



Graph 9. Equal-ratio performance graph for oral reading performance.

The visual display of discrepancies usually provides a measure for communicating most clearly with staff, parents, and child. Many decisions can be based on visual displays alone. When more precise information is required however, the discrepancy also can be described numerically.

Describing Discrepancies Numerically

To compute a numerical discrepancy for a progress graph two items of information are needed:

1. the desired level of progress (mastery) on the set of tasks (i.e., the curriculum units or objectives) for a reference group of students (usually the average of the same-aged peers); and
2. the actual level of progress (mastery) of the referred student on the set of tasks.

When the desired and actual levels of progress have been determined, the *discrepancy ratio*, which is the relative difference between the two levels, is easily computed by dividing the higher level of mastery by the lower level. The result of this division always yields a number that is greater than or equal to 1.0 and specifies the number of times greater one progress level is than another. Ordinarily, the result tells us how many times faster the average student is progressing through or performing or the set of tasks than the referred student.

In Graph 8, we plotted data for an individual student on mastery of math objectives. To determine the discrepancy ratio for this student, we follow the numbered steps.

STEP 1 *Determine Actual Level of Progress.*

This level is the number of weeks (months or years) of progress achieved in the time already spent in the instructional program. In Graph 8, we can see that the student has been in the program for 16 weeks. In that time, he has mastered Level I material, which is equal to 5 weeks of progress for average students.

STEP 2 *Determine Desired Level of Progress.*

Desired progress is one week for each week in the program. (If the graph were developed for units of days, months, or years, desired progress would be expressed accordingly. The important point is that on progress graphs the relation is always one to one: one unit of progress for one unit of time.) In Graph 8, then, a student who has been in the program for 16 weeks should have mastered 16 weeks of work (in this case, Level III in the curriculum).

STEP 3 *Compute the Discrepancy Ratio.*

The higher level of progress must be divided by the lower level of progress. The formula is,

$$\text{Discrepancy Ratio} = \frac{\text{Larger Number (Level of Progress)}}{\text{Smaller Number (Level of Progress)}} = \frac{16\text{ Weeks}}{5\text{ Weeks}} = 3.2\text{ or }3.2\text{X}$$

Since the discrepancy ratio tells us how many times greater one level of progress is than another, in this case it tells us that students progressing at the desired rate of progress are progressing 3.2X faster than the target student. (Conversely, the target student is progressing 3.2X slower than the desired rate of progress.)

To compute the discrepancy for a performance graph two items of information are also needed:

1. The desired (usually the median[1]) level of performance of average students on the skill or behavior of interest; and

2. The actual (median) level of performance of the referred student prior to program modification.

The procedure used to compute the performance discrepancy ratio is the same as for the progress discrepancy ratio: Divide the higher level of performance by the lower. The result is a number greater than 1.0 that indicates the number of times greater one level of performance is than the other.

In Graph 9, we plotted data for an individual student's performance in oral reading. We compute the discrepancy ratio in oral reading performance between this student and average students in the class as follows:

STEP 1 *Determine Actual Level of Performance.*

There are 11 data points on Graph 9 for the referred student's performance in oral reading. When we order these numbers from low to high--48, 49, 50, 50, 52, 52, 52, 60, 60, 70, 75--we find that the median (or middle number) is 52. This is actual (baseline) performance for the referred student.

---

[1] The median is the score that divides the distribution into halves; 50% of the scores fall below the median and 50% above. The median, along with the mode and mean, are measures of central tendency. Any of these measures may be used but we prefer the median because it is less sensitive to extreme scores and is relatively easy to compute.

Were only one sample of performance available, we might have a somewhat different picture of this student's performance level in oral reading, depending upon which day testing was done.

STEP 2 *Determine Desired Level of Performance .*

Median performance for average students in the school in oral reading is 100 words per minute. This is desired performance.

STEP 3 *Compute the Discrepancy Ratio.*

The higher level of performance must be divided by the lower level of performance.

$$\textit{Discrepancy Ratio} = \frac{\textit{Larger Number (Level of Performance)}}{\textit{Smaller Number (Level of Performance)}} = \frac{100}{52} = 1.9X$$

In this case, the discrepancy ratio tells us that students who are reading orally at the desired level are performing 1.9X faster than the referred student (or the referred student is 1.9X slower).

Other examples: 1. Desired Performance = 20/min.; Actual Performance = 20/min.

$$\frac{\textit{Larger Level of Performance}}{\textit{Smaller Level of Performance}} = \frac{20/min.}{20/min.} = 1X \text{ (There is no discrepancy.)}$$

2. Desired Performance = 30/min.; Actual Performance = 60/min.

$$\frac{\textit{Larger Level of Performance}}{\textit{Smaller Level of Performance}} = \frac{60/min.}{30/min.} = 2X \text{ (Actual performance is } 2X \textit{ faster than desired performance.)}$$

APPLICATION In Graphs 10a and 11a, two further examples of data on student progress and performance are shown. In each case the discrepancy ratio is not computed. Make the computations yourself.

EXAMPLE: Computing a Progress Discrepancy Ratio.

John has been referred for program modification in reading by his classroom teacher. Desired progress in reading at John's school is determined by mastery of the material in the Basal Reading Series. The levels to be mastered at specified points in time are listed on the ordinate of Graph 10a. These expectations represent desired mastery for average students progressing at an average rate, as determined by classroom teachers, administrators, and other school personnel. To determine the discrepancy ratio we will:

1. *Determine John's Actual Level of Progress.*
   John's mastery level is beginning Level II or 6 months of progress. John has been in school for 22 months.
2. *Determine Desired Level of Progress.*
   Since John has been in school for 22 months, he is expected to have progressed 22 months in the reading series (completion of Level 5).
3. *Compute the Discrepancy Ratio.* (Check your answer below.[2])

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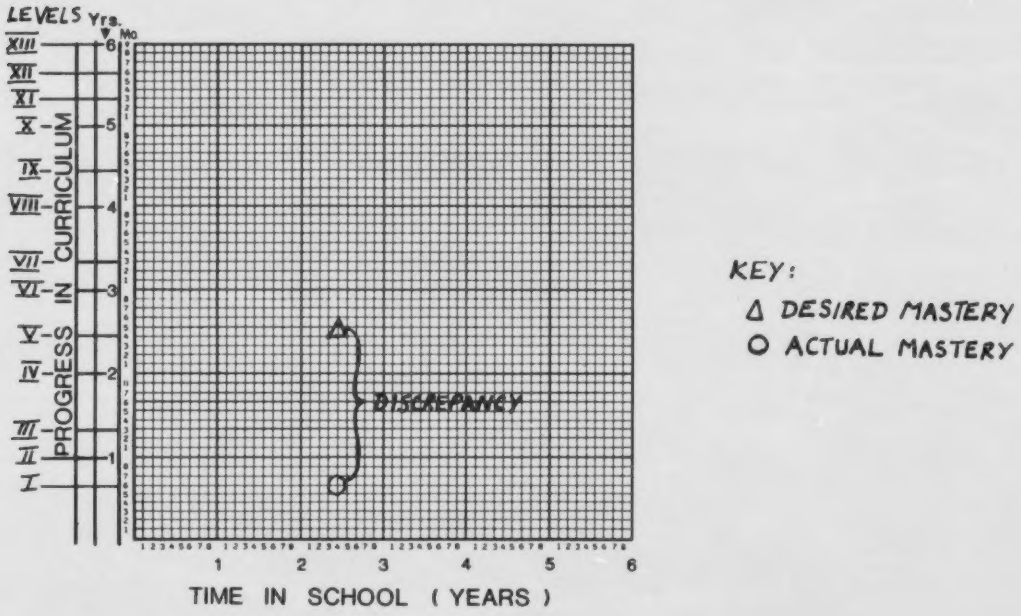
[2] Since the discrepancy ratio is the larger number divided by the smaller, we divide 22 by 6. John's progress is 3.7X slower than desired.

STUDENT: SCHOOL: CURRICULUM:



Graph 10a. John's progress in the Basal Reading Series and desired progress for students progressing at an average rate.

EXAMPLE: Computing a Performance Discrepancy Ratio

Sally has been referred for program modification by her classroom teacher. The teacher feels Sally's difficulty with handwriting slows down her work completion. To determine if a discrepancy exists the discrepancy ratio will be computed.

1. *Compute Actual (Baseline) Performance Level.*
   Three data points on Graph 11a--10, 15, 15--represent Sally's performance in handwriting on three occasions. The median of these three points is 15. This is Sally's actual (baseline) performance in handwriting.
2. *Determine Desired Performance Level.*
   In Sally's class, median performance on writing letters per minute is 45. This is the desired rate of performance.
3. *Compute the Discrepancy Ratio.* (Check your answer below.[3])

Estimating Progress/Performance Requirements

After the discrepancy ratio has been computed, the next step in DBPM is to estimate how much progress/performance must be achieved to reduce (or eliminate) the discrepancy within a specified time period.

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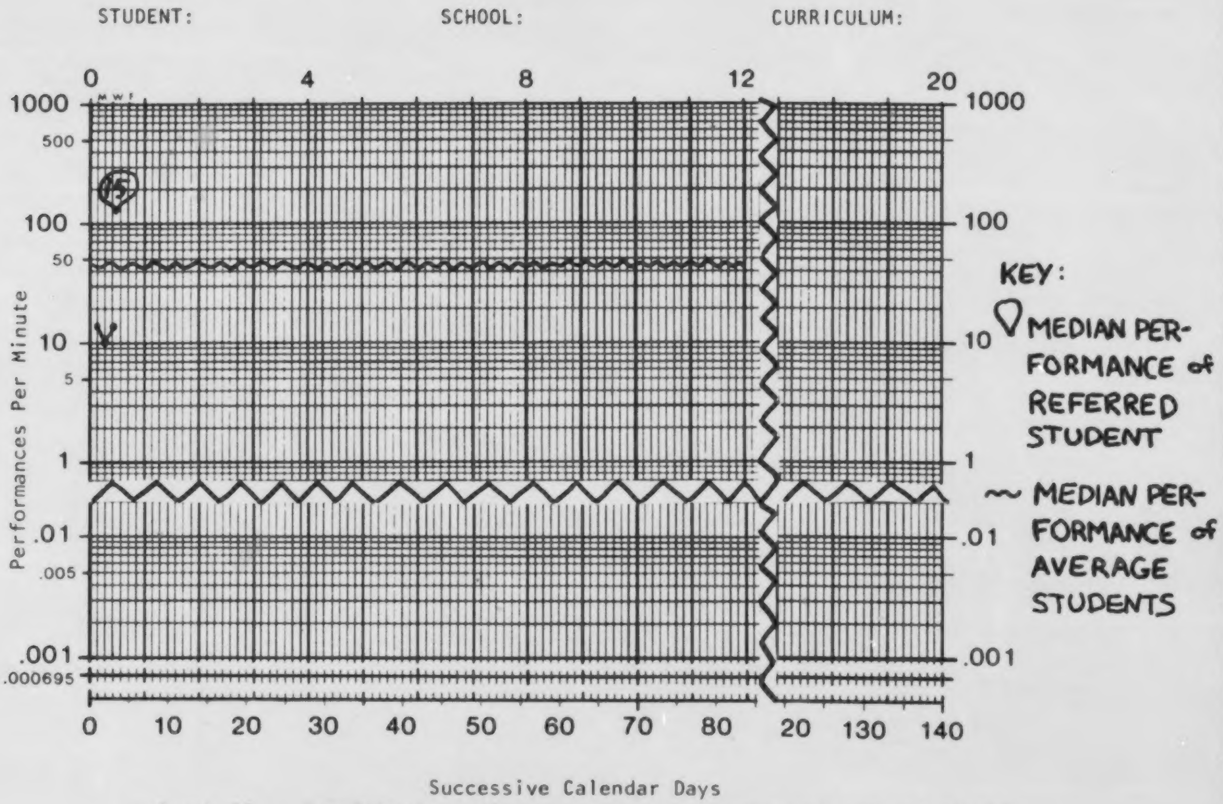
[3] The discrepancy ratio is 3X. Sally is performing 3X slower than average students in her class.



Graph 11a. Equal-Ratio performance graph: letters written per minute.

A progress estimate specifies the amount of progress to be made in one of two ways: (a) per unit of time (i.e., number of months of progress/month); (b) per amount of material (i.e., number of tasks, pages, etc., to be mastered per unit of time).

The performance estimate specifies the amount of change in performance required per unit of time (i.e., 1.5 math facts faster/week; .5 fewer noise behaviors per week, etc.).

Both estimates are valuable data for program planning and program adjustment decisions. Estimates are made of (a) how much more rapidly a student must progress than prior to tne intervention; (b) how much material must be covered; and (c) how much faster or slower a student must perform certain tasks. Such estimates provide information with which to plan the student's program; write program objectives; monitor program implementation; and evaluate program modification effects.

Should 20, 30, or 40 objectives in the next 30 weeks be the progress goal for student A? Should student B increase his oral reading rate by 5, 10, or 15 words/week? Should the objective for student C be to decrease noise behavior by two/minute each week? The teacher need not be faced with an arbitrary prediction of how quickly a student's behavior needs to change. The necessary rate of progress/performance change can be estimated with some precision by the following procedure.

Computing Progress/Performance Estimates

STEP 1 *Determine the length of time available to implement the program modification.*

STEP 2 *Determine the improvement needed in progress or performance.*

a. Determine what mastery performance level is desired at the end of the intervention period.

For Progress Graphs

Find the calendar date on the horizontal axis that represents the proposed conclusion of the program modification. The point at which this line intersects the diagonal line of the graph is desired mastery level.

For Performance Graphs

The median performance of average students at the time of initial assessment or a standard performance level, such as the Starlin guides, are used as desired mastery level.

b. Subtract the target student's present mastery or performance level from desired level (mastery or performance) to determine the amount of improvement needed

STEP 3 *Divide improvement needed (mastery or performance) by the time available for the intervention to determine progress performance needed per unit of time.*

APPLICATION Here are four examples of progress/performance estimates for John and Sally. We have estimated progress for two intervention periods for each student: 5 months and 14 months for John, and 15 weeks and 30 weeks for Sally.

EXAMPLE: Progress Estimate for 5 Months for John.

STEP 1 *Time Available* = 5 months.

STEP 2 *Desired Mastery Level* = 5 months from present (or end of Grade 3) = 27 months

Present Mastery Level = 6 months (or middle of Grade 1) = 6 months

Improvement Needed = 21 months

STEP 3 *Progress Estimate.*

A. Per Unit of Time:

$$\frac{\textit{Improvement Needed}}{\textit{Time Available}} = \frac{21 \text{ months mastery}}{5 \text{ months}} = 4.2 \text{ months of progress/month}$$

B. Per Unit of Material:

Improvement Needed = 21 months mastery

On the vertical axis of the graph, 21 months of mastery beginning at month 6 (John's present mastery level), and continuing through month 27 (6 + 21), includes completion of Book Levels II, III, IV, V, and VI.

The number of pages to be mastered at each level is as follows:

Level		Pages
II		100
III		190
IV		175
V		200
VI		285
	[Total]	950

Therefore, the monthly progress estimate is:

$$\frac{\textit{Improvement Needed}}{\textit{Time Available}} = \frac{\text{950 Pages}}{\text{5 months}} = \text{190 pages of mastery/month}$$

The weekly progress estimate is:

$$\frac{\textit{Improvement Needed}}{\textit{Time Available}} = \frac{\text{950 Pages}}{\text{20 weeks}} = \text{47.5 pages of mastery/week}$$

The daily progress estimate is:

$$\frac{\textit{Improvement Needed}}{\textit{Time Available}} = \frac{\text{950 Pages}}{\text{100 days}} = \text{9.5 pages of mastery/day}$$

EXAMPLE 2

What would the progress estimate be for a 14-month intervention period? Compute this progress estimate and check your answer below.[4]

EXAMPLE 3: Performance Estimate for 20 Weeks for Sally. (See Graph 11a.)

STEP 1 *Time Available* = 20 weeks.

STEP 2 *Desired Performance* = 45 letters/minute (assuming average students do not increase speed).

$$\frac{\textit{Actual Performance}}{\textit{Improvement Needed}} = \frac{\text{15 letters/minute}}{\text{30 letters/minute faster}}$$

STEP 3 *Performance Estimate* = $\frac{\text{30 letters}}{\text{20 weeks}}$ = 1.5 letters/week faster

EXAMPLE 4: Performance Estimate for 15 Weeks for Sally

STEP 1 *Time Available* = 15 weeks.

STEP 2 *Desired Performance* = 45 letter/minute.

$$\frac{\textit{Actual Performance}}{\textit{Improvement Needed}} = \frac{\text{15 letters/minute}}{\text{30 letters/minute faster}}$$

STEP 3 *Performance Estimate* = (Make the computation and check your answer below.)[5]

Writing Program Objectives

The procedures discussed up to this point are all that is required to write program objectives. Several examples of such objectives follow:

EXAMPLE 1: Program Objectives for John: Reading in the Basal Series.

Longe Range Objective for a 5-month intervention period.

Given a selection from any book in Level II-VI in the Basal Reading Series John will read the selection at a rate of 50 words/minute with 2 or fewer errors and answer comprehension questions with 80% accuracy.

Daily Objective for a 5-month intervention period:

---

[4] Improvement needed is 30 months in 14 months or 2.1 months/month. On the vertical axis of the graph we can see that 30 months of progress beginning with month six and continuing through month 36 (6 + 30) includes completion of Book Levels VII and VIII. Since there are 440 pages in Levels VII & VIII, the total number of pages to be mastered is now 1390. When divided by time available, we find that for a 14-month intervention, John must master 99 pages per month (1390 divided by 14); approximately 25 pages/week (1390 divided by 56 weeks); and approximately 5 pages/day (1390 divided by 280 days).

[5] For each week of the 15-week intervention, Sally will have to write letters at a rate which is two letters faster than the previous week (30 divided by 15).

Each day of school, John will read approximately 9.5 pages in the Basal Reading Series at a rate of 50 words/minute with two or fewer errors and answer comprehension questions with 80% accuracy.

Weekly Objective for a 5-month intervention period:

Each week of school John will read approximately 47 pages in the Basal Reading Series, etc. Can you write long-range and daily objectives for a 14-month intervention period for John?

EXAMPLE 2: Program Objectives for Sally's Performance in Handwriting

Long Range Objective for a 15-week intervention period:

Given a paragraph to copy from the board, Sally will write the paragraph at a rate of 45 letters/minute with 100% accuracy.

Daily Objective for a 15-week intervention period:

Each week, when asked to copy a paragraph from the board, Sally will copy the paragraph at a rate that is two letters faster than the previous week and with 100% accuracy.

Can you write the long-range and daily objectives for a 30-week intervention period for Sally?

Visually Describing Progress/Performance Estimates: Drawing Estimated Progress and Performance Lines on Graphs

The estimated progress or performance lines are visual illustrations of estimated progress. What is indicated by the line is general trend and direction which the data must take based on the progress/performance as estimated. Here is how to draw estimated progress performance lines.

a. *For progress graphs*, find the present mastery point for the target student and the desired mastery point at the completion of the program modification. Connect the two points with a broken __ _ __ _ line.

b. *For performance graphs*, find the points that represent the present median performance for the target student and desired performance at the completion of the program modification. Connect the two points with a broken __ _ __ _ line.

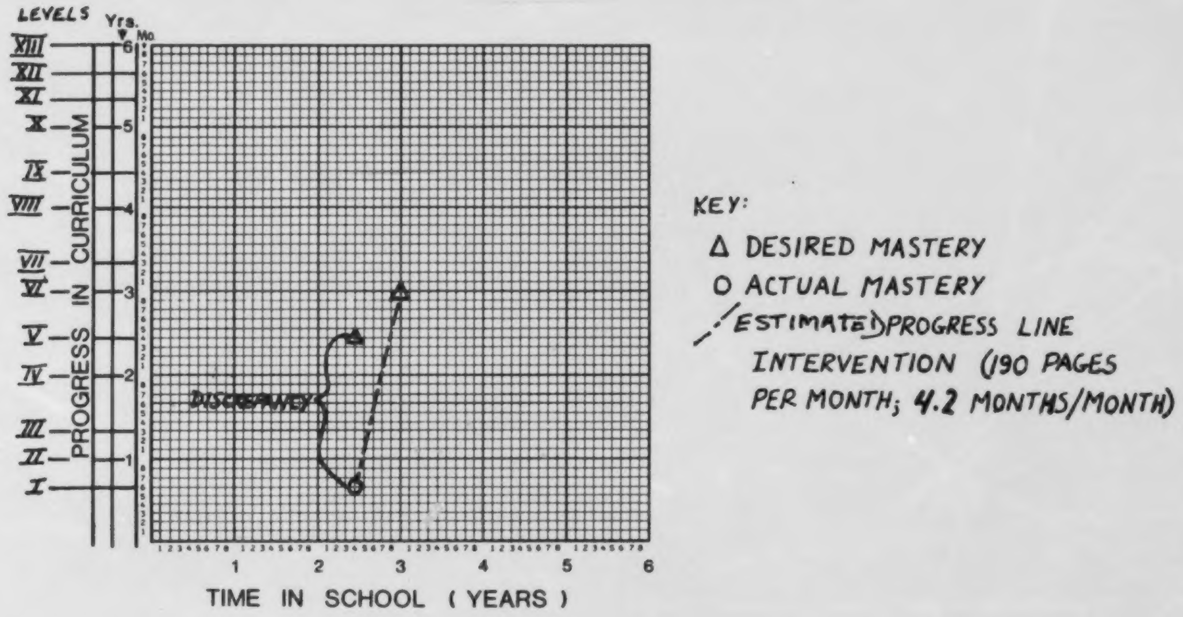
APPLICATION

In Graphs 10b and c estimated progress lines are drawn for John for the two intervention periods of 5 and 14 months.

In Graphs 11b and c estimated performance lines are drawn for Sally for 20- and 15-week intervention periods.

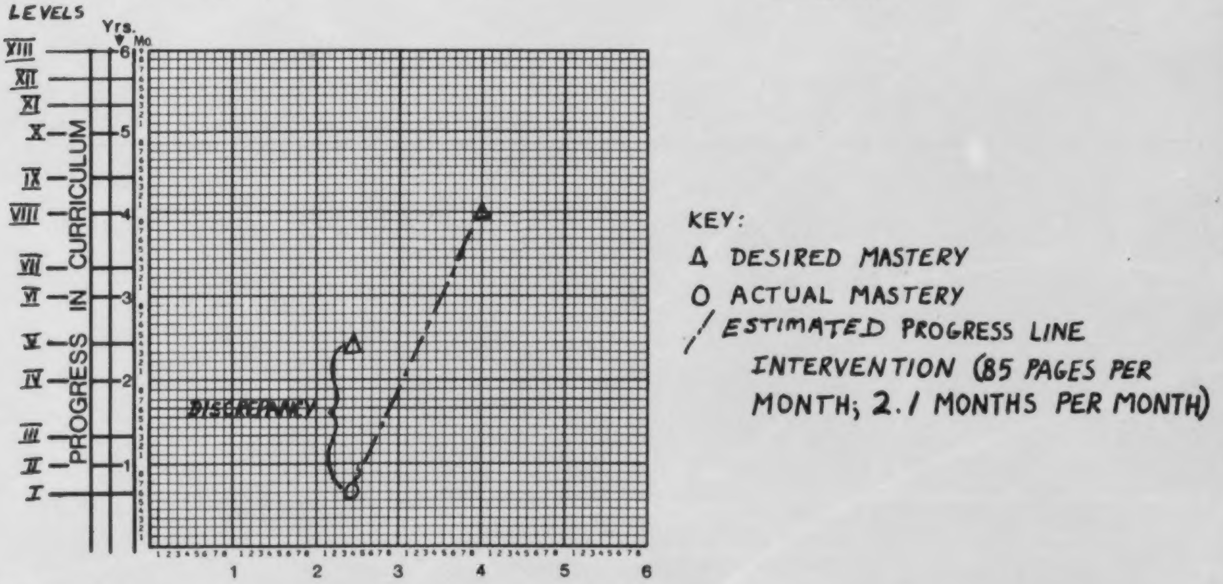
Each time a point is plotted on a graph or the student's program is reviewed, actual progress/performance may be evaluated in terms of its relation to the estimated progress/performance line. No computation is needed. Program adjustment decisions are in large part determined by whether the progress/performance estimate is being approximated. While actual achievement may never reach estimated achievement, the information thus derived continually influences and guides program modification decisions. Deviations from the line signal the need for a program change. (See Part IV, Decision Rules for Making Program Changes.)

STUDENT: John SCHOOL: CURRICULUM:

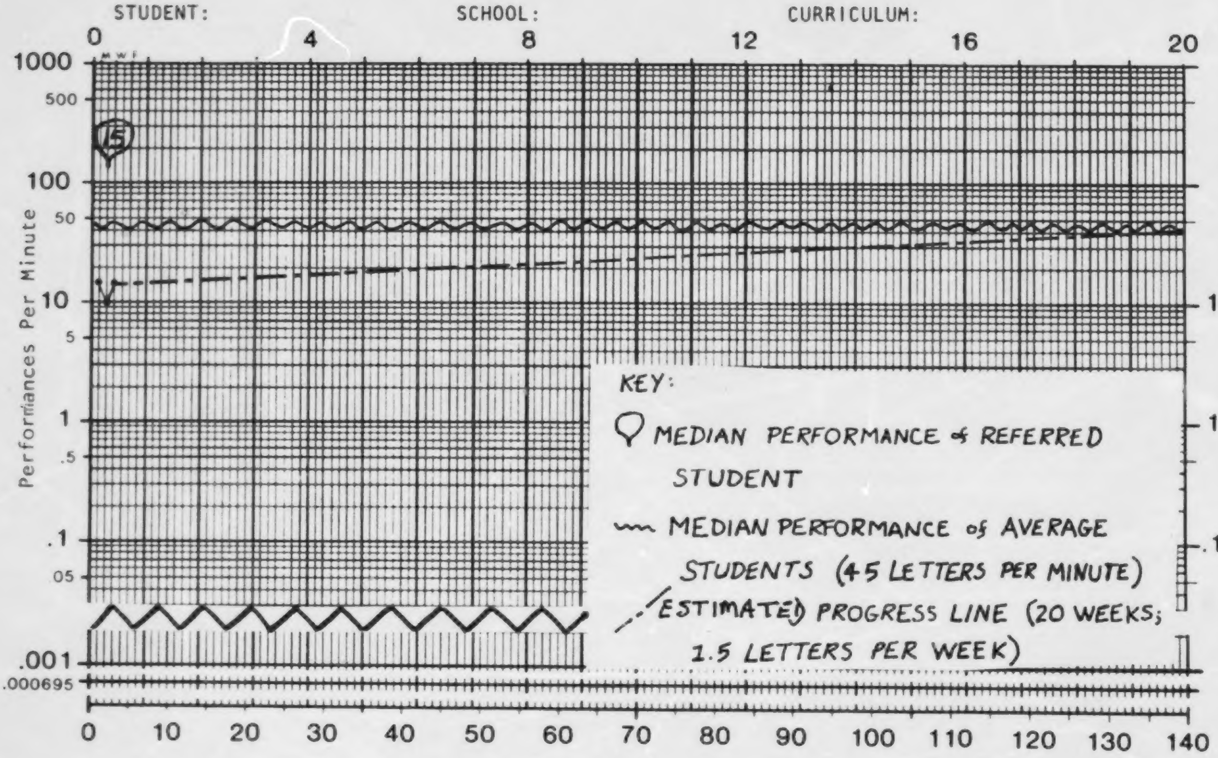


Graph 10b. John's estimated progress for a 5-month intervention.

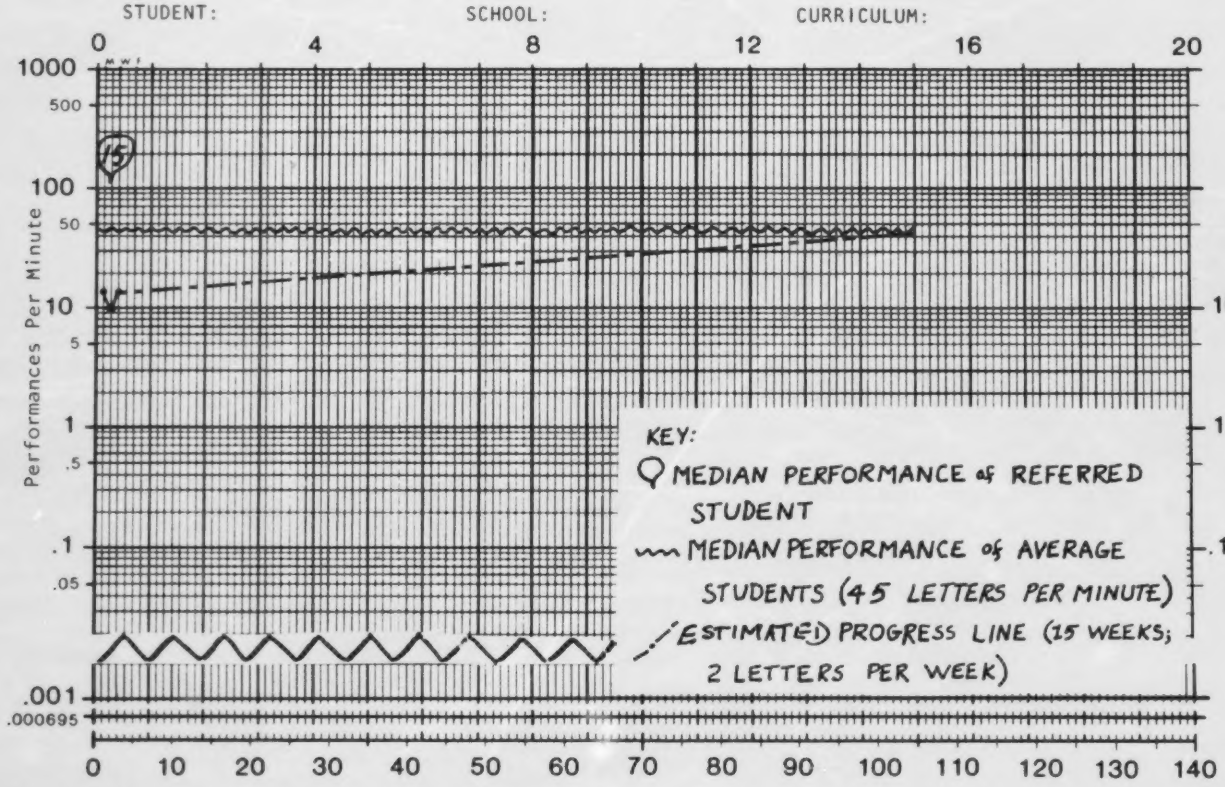
STUDENT: John SCHOOL: CURRICULUM:



Graph 10c. John's estimated progress for a 14-month intervention.



Graph 11b. Sally's estimated performance for a 20-week intervention period.



Graph 11c. Sally's estimated performance for a 15-week intervention period.

Are Other Data Needed in Data-Based Program Modification?

All the basic data collection, graphing, and computation procedures of DBPM have now been presented. This information is reviewed in subsequent chapters. In addition, there are described procedures for data analysis. These are based entirely on the discrepancy ratio and graphed data we have described.

References

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PART II

Developing DBPM Skills in Problem Selection

Introduction

In Part II there are described the specific procedures that are used in the Problem Selection phase of DBPM. The organization follows the format that is shown in the flow charts in Chapter II.

Part II is divided into three chapters: Chapter IV, communication and collaboration procedures; Chapter V, measurement procedures; and Chapter VI, evaluation procedures.

Each chapter starts with an overview and then lists the questions that are specific to the matrix cell on which the chapter is based. The third and main part of the chapter comprises the data-gathering activities by which the matrix cell questions are answered. All necessary procedures, materials, and forms are discussed in detail and illustrated. Throughout, the general is made specific in the example of Ricky.

Try to keep the following questions in mind as you go through the chapters:

1. What is the problem that is the basis for the referral and what is its importance in the setting in which the pupil is asked to function?
2. What would be the discrepancy ratio for a student like Ricky and the average students in your school?
3. Would the discrepancies be considered important? Would a student like Ricky be eligible for service?
4. Can you pinpoint similarities and differences between DBPM procedures and those which you have used in the past in problem selection? Are the differences important?

Chapter IV

PROBLEM SELECTION: INITIAL COMMUNICATION AND COLLABORATION

Decision Area:
Problem Selection

Program Phase:
Initial Assessment

Contents

Overview
Matrix questions
Data-gathering activities and forms

Overview

One of the most frustrating tasks facing special educators in the development of successful individualized programs to integrate handicapped children into mainstream programs is determining "the problem." Handicaps themselves permit us only to speculate on why a pupil is difficult to teach; merely identifying a handicap often obscures the pupil's instructional program needs. For example, if a hearing-impaired child in the fourth grade has the vocabulary comprehension of a second-grade pupil, the problem is not that he is hearing impaired but that there is a discrepancy between his performance in language comprehension and the performance considered culturally desirable for fourth graders. To successfully integrate such a child, the educational program must either improve his langauge comprehension or change the cultural desire for language comprehension. From our point of view then, "the problem" is never the child's handicap; it is always the discrepancy between desired and actual performance (or progress).

In Data-Based Program Modification, the initial step in identifying the problem is to determine the performance that is desired. The task is not easy. There are many people whose desires for performance must be considered. The most significant are the referring teacher and other school personnel with whom the student must interact. Yet, in many school systems it is noteworthy that the only area in which it is possible to identify a series of desired performance levels is the reading program; in most other subject areas, performance desires of teachers differ significantly from class to class and school to school, even within the same district. Thus, although the perceived discrepancy between desired and actual performance is the basis for a pupil's referral, information on what is desirable is often difficult to elicit.

A simple illustration is the common desire of classroom teachers for all children to sit in their seats and not talk, unless they are directed otherwise. In these days of criticism by advocates of open schools and classrooms, such a desire may be publicly unmentionable; behind the classroom door, nevertheless, it may significantly influence the life of a pupil. (Like many other classroom observers, we have found that "out of place" and "making noise" are two behaviors that, if they occur too frequently, identify a child as a behavior problem.)

One method of obtaining information on desired performance is to conduct interviews and distribute questionnaires that provide the framework for establishing and/or negotiating desired performance goals. Thus, arranging interviews, obtaining parental consent, and determining the order of performance goals, as well as conducting the interviews, should be given the highest priority.

In contrast, some teachers deny that they desire certain general performance from all of their pupils; they state that "each child is an individual with his own unique characteristics" and, therefore, with his own unique set of performance needs. Such teachers may overlook the fact that they may desire common performances like "independent decision making" or "self-sufficiency," and that they identify as discrepant children who fail to operate independently. The identification would not be made if individualized goal setting really existed.

Anyone who cares about a child's ability to cope with the world probably holds some preconceived expectations for him. We should attempt to be more explicit about these expectations and not to allow them to remain implicit. ("Is the unexamined desire worth having?") It is extremely difficult for a special education resource teacher to work in a context in which desired performance is not stated and the attempts to make desires explicit are thwarted by defensive teachers, administrators, or parents. Yet experience proves that whenever a child is identified as having or being a problem, some incongruity or discrepancy between desired and actual performance can be identified.

A good example is Ms. B., a third-grade teacher at River Run School who has just begun the year with a new class. Although it is only a few days into the term, Ms. B. already has identified a number of children who, she believes, "have problems." Of particular concern to her is Ricky; he always seems to be in the middle of a fight, complains a lot that people are teasing him, and appears to be very inattentive to and disinterested in academics. Ms. B. runs a fairly "tight ship," and although she has difficulty being explicit about her classroom expectations, it appears that Ricky is not meeting her expectations for performance. When asked by the SERT in the school if she believes any children in her class should be referred, Ms. B. immediately thinks of Ricky and fills out a referral form. The SERT, together with Ms. B. and others in the school charged with making placement decisions for special education service, now face the following questions:

1. What is the problem(s) that is (are) the basis of the teacher's referral.
2. Who owns the problem? Is the problem the pupil's? teacher's? (In example, it is Ms. B.'s.)
3. What is the discrepancy between the desired performance for the pupil and the pupil's actual performance.
4. Is the discrepancy between desired and actual performance important enough to warrant special education intervention?

Whether Ricky receives service, that is, is accepted for special education program modification, depends in large measure on the results of these determinations.

In this first phase of problem selection the SERT attempts to answer questions 1 and 2. During interviews with Ms. B., Ricky, Ricky's parents, and the other people who are part of Ricky's school life, the SERT tries to pinpoint the performance that each desires of him. Each person is asked to list and establish priorities among those school problems which they believe require modification. Pinpointing desired performance and setting priorities for behavior change is what we call the assessment of the "subjective dimension" of the referral.

The forms developed to elicit information on the subjective dimension of the referral are keyed by circled numbers to the circled numbers in the matrix cell questions. They are as follows:

1. Initial referral.
2. Communication with referrer.

3. Conference with teacher (referrer).
4. Observation and assessment schedule.
5. Conference with student.
6. Parent consent.
7. Conference with parent(s).
8. Staffing request.
9. Priority ranking.
10. Case report (all data gathered in this phase of DBPM).

On the facing pages, there are given brief descriptions of the purposes of the forms.

Each form represents only one of a number of possible versions. We find our versions useful because they develop the kind of information on a pupil like Ricky which is important to us. As part of our continuing example, therefore, all the forms are completed in terms of Ricky's problems. If you are interested in obtaining or showing other kinds of information, you should revise the forms to accord with your purposes.

PROCESS: Communication & Collaboration

DECISION AREA: Problem Selection
PROGRAM PHASE: Initial Assessment

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
1. Who owns the problem?	Referral form. ①	Acknowledge receipt of form. ①
Are the problems those the teacher identifies?	Procedures for arranging teacher conference. ② Format for teacher conference. ③	Arrange and conduct conference with teacher. (2 & 3)
Are the problems those the student identifies?	Procedures for arranging student conference. ④ Format for student conference. ⑤	Arrange and conduct student conference. (4 & 5)
Are the problems those the parent identifies?	Procedures for arranging parent conference. ⑥ Format for parent conference. ⑦	Arrange and conduct parent conference. (6 & 7)
Are the problems those the school principal or other professionals identify? Are they shared problems?	Procedures for arranging staffing; consultations. ⑧	Arrange staffing; consultation or data gathering by other professionals. ⑧
Should other professionals be consulted?		
Do those who identify problem(s) have priorities as to their importance?	Procedures for determining priorities. ⑨	Ask appropriate parties to complete form. ⑨
		Summarize data on Case Report Summary One. ⑩

① Referral Form

This form is used by any faculty member in the school who wishes to establish initial contact with the SERT regarding a student. The form encourages teachers to limit their initial comments to objective statements about the social and academic behavior of the student being referred. Note that the referrer is continuously reminded to "be specific" in identifying the areas of concern.

REFERRAL FORM ①

Directions: Please complete all items on top half of the form. Additional comments are welcomed but not required. Please leave in SERT's box. A conference will be scheduled within 5 days of receipt of request.

Request for Program Modification

To: Special Education Resource Team

From: Ms. B. Date: 9-9-75

Re: Ricky J. Grade: 3

Age: 9 Room #: 204

Parent, Name: Harry J.

Parent, Address: 14092 Lucky Lane Home Phone: 948-2735

Reason for Referral: (Describe child's problem in brief but specific terms.)

Teacher's Comments

✓ Reading difficulty. If so, at what level does student currently read with 85% accuracy? Series Read Book B

At what level would student have to be reading by the end of the year to not be considered a reading problem? Book D

✓ Mathematics difficulty. If so, on what pages of the math book can the student succeed? Book ____ Pages ____ none used

How far do you expect to go in that book by the end of the year? Page ____

✓ Social difficulty. Please list those specific things the student does, or doesn't do, which make the student different from classmates. Makes a lot of noise; fights a lot.

✓ Other areas of academic difficulty. (Be specific.) Handwriting; spelling

Request for Conference with Referrer

Please list three alternative days and/or hours during the next school week which would be convenient for you to meet with the Special Education Resource Teacher (SERT).

	TIME	TIME
Monday	930 - 950	Lunch
Tuesday		
Wednesday	10^{15} - 10^{35}	
Thursday		
Friday		

COMMUNICATION WITH REFERRER ②

Your application for Special Education assistance for Ricky (name of child) was received on 9-9-75 (date).

SERT (SERT's name) will meet with you in teacher's lounge (room #) on 9-12 (date) at 9^{30} (time).

Please bring any samples of work or materials which are appropriate.

③ Conference with Teacher (Referrer)

The conference with the referrer permits the SERT to clarify the teacher's performance expectations for students in the class. The SERT attempts to elicit from the teacher (referrer) the particular behaviors of the referred student which the teacher views as most in need of modification. Additionally, the conference focuses on positive aspects of the teacher-student relationship and the teacher's knowledge of the student's interests. This information is important in developing a program plan.

CONFERENCE WITH TEACHER (Referrer) ③

Directions: Be sure to plan for at least a 20-30 minute conference. If the teacher doesn't mind you may wish to record the meeting and transcribe the tape later.

	Conference Notes:
1. If there is an academic problem pinpoint specific areas of difficulty. For example - if there is a reading problem you may wish to ask some of the following questions:	
a. Oral Reading. How does the student read compared to others in the group?	Very poorly
b. Comprehension. Does he seem to understand what he reads?	No
c. Word Attack. Does he attempt unknown words? What kind of words does he miss?	Not usually Can't say
d. How willing is he to read?	Not very
e. How willing is he to listen to stories?	Likes stories a lot
2. Pinpoint specific math difficulties.	Doesnt know math facts
3. Other academic areas (i.e., Social studies, English, etc.)	not relevant
4. If there is a social/behavior adjustment problem pinpoint specific ares of difficulty.	Noise and fights
5. Are there other students who have similar problems? (How discrepant is he from group?)	Only 1 or 2 but not as bad.
6. Do there appear to be any conditions which improve learning? Are there any specific classroom activities, programs, people which are particularly reinforcing?	Ricky likes cars
7. Are there any peer relationships which are particularly negative or positive.	Fights with other boys
8. Are there any conditions which are particularly disturbing or disruptive (evoke particularly unfavorable responses?)	People tease him because he's so slow.
9. Is there any feedback from the teacher regarding progress: If so, how frequent? Is the feedback negative or positive? Are there grades, check system, verbal praise?	Too many students to give Ricky the attention he needs.
10. How does the teacher view the child? a. Is he generally tired or energetic? b. Restless or relaxed? c. Dependent or independent? d. Quiet or noisy? e. How different does teacher perceive child to be? f. Is he aggressive or withdrawn? g. Is he popular or unpopular with peers?	Teacher feels Ricky is more restless, hyperactive than other children.
11. Are there any teacher-perceived obstacles to performing as desired (i.e., visual or auditory deficits?)	None except learning disability
12. What specific kind of assistance would be most helpful to the teacher?	Direct service out of classroom. Materials to use in class.
13. What are teacher priorities for the student? Have the teacher complete priority ranking sheet (if not completed during initial referral).	See priority ranking form.

④ Schedule for Observation and Academic Assessment

Assessment of the discrepancy between the referred student's behavior and that of his peers requires multiple observations of both within the environment from which the referral has emanated.

This form is completed at the end of the conference with the referrer and establishes set times over a period of 3-5 days for both academic and social behavior assessments. Three to five days of assessment and observations are necessary as data are always summarized in DBPM in terms of median performances.

Directions: At the conclusion of the teacher conference complete the schedule for observation and assessment in duplicate and give 1 copy to teacher and retain other copy for your file. ④

Classroom Observation Schedule*			Academic Assessment Schedule**	
Monday	9/16	9- 9^{20}	9/16	9^{30} - 10^{10}
Tuesday	9/17	10^{30} - 10^{50}	9/17	9^{30} - 10^{10}
Wednesday	9/18	2^{00} - 2^{20}	9/18	9^{30} - 10^{10}
Thursday	9/19	9 - 9^{20}		
Friday	9/20	11- 11^{20}		

For: Ms. B. (Teacher's Name) Re: Ricky (Student's Name)

By: SERT (SERT's Name)

*Designate a 20-minute time period during each of four or five days which will be convenient for observation in the classroom.

**Designate a 30-minute time period during each of three days which will be convenient for academic assessment.

⑤ Conference with Student

The purpose of this conference is to give the student an opportunity to express his views of school as well as to identify his areas of interest. By identifying interests, we may find clues to what will positively reinforce desired academic and social behavior. The questionnaire format used here is only one of many ways to conduct student interviews.

At the intermediate and secondary levels, if a form of this type is used it can be distributed as a questionnaire to the entire class. When such a form is used in a conference, it may be advisable for the SERT to do the actual writing. In the conference with Ricky, the SERT discussed each question with him before filling in the answers.

EXAMPLE OF A STUDENT QUESTIONNAIRE (FOR USE IN LIEU OF A CONFERENCE) ⑤

9/16 Date

Ricky Student's Name

STUDENT QUESTIONNAIRE

1. If I had three wishes I'd ask for a car, truck, and a model.
2. The best thing the teacher can say to me is stop working.
3. My favorite game is playing cars.
4. I like to get candy.
5. My best friend in school is nobody.
6. The best place in the school is the gym.
7. The school period I like best is recess.
8. When I get my work done I like to play cars.
9. The best thing that could happen to me in school is to have teacher smile.
10. If I could do anything in school that I wanted, I would play.
11. The most fun that I have in school is playing.
12. The subjects I need the most help with are reading and numbers.
13. The subject I want to work on first is reading.
14. If I could have help with reading I would be glad.
15. If I knew I could play cars I'd work on my reading every day for at least 15 [✓ mins.]/hours.
16. What are student's priorities for him(her)self?

    Ask student to complete the priority ranking sheet.
    (see also questions 12 & 13.)

Additional Comments:

⑥ Communication with Parent

Parent Consent Form

The concept of due process so frequently articulated by the courts during the last decade makes it incumbent upon all educators, and particularly those in special education, to insure that student's rights are protected. This form is used to obtain written consent of the parent. It fulfills the due process requirement of P.L. 94-142.

Note that the time selected for the conference was not convenient for Ricky's parents. The SERT telephoned after the form was returned and an alternate date was agreed upon.

⑦ Conference with Parent

This conference attempts to establish a collaborative relation between home and school. The suggested questions are meant to pinpoint the extent to which the student's perceived difficulties in school are reflected in his behavior in other settings.

In addition, the parent is asked to identify his/her priorities for the child. These priorities are considered equally with those of the teacher and student.

PARENT CONSENT FORM ⑥

Your [✓ son]/daughter Ricky (name) has been referred to the Special Education Resource Teacher for assessment of his performance in classroom work, particularly reading, math, handwriting, spelling (subjects).

I would like to meet with you on 9/19 (date) at 3:30 (time) to discuss Ricky's (name) school work. In addition, your written permission to conduct this assessment is needed.

Thank you for your cooperation.

Sincerely,

Ms. Jones

- -

Please tear off and return with student or in mail

I hereby consent to having Ricky's (name) school performance assessed by the Special Education Resource Teacher.

The conference time suggested is/[✓ is not] convenient. Please call me at [✓ home]/work to arrange an alternate time. The telephone number is 948-2735.

Mrs. R.L. Jones
Parent's Signature

EXAMPLE OF CONFERENCE WITH PARENT(S) ⑦

	Conference Notes
1. Does the student have difficulties at home? If so, are there specific areas of difficulty that parent feels may be related to school performance.	Yes. He gets teased a lot and doesn't like it.
2. Are there any specific activities or conditions which cause unfavorable responses at home?	He and his brother share a room.
3. Are there any specific activities or conditions which student enjoys?	He likes models, cars
4. How does the parent view the child? (See teacher interview question 10.)	Not very different from other children.
5. Are there any parent perceived obstacles to student performing as desired?	Needs to have more time to get work done.
6. What specific kinds of school assistance would be most helpful to the parent?	Reading, math
7. What are parent priorities for the student? Have parent(s) complete priority ranking sheet.	Academics

Additional Comments: Will do anything school requires

Date 9/20/75

Participants Mrs. Jones
SERT

⑧ Staffing Request Form

This form identifies the students who will be discussed by the school team designated to establish eligibility for special education service, and to review the cases of students who already are being served. The composition and responsibilities of this team vary widely. While the team approach is an accepted means of making decisions in some communities,* in others, decisions are made by individuals or by default. Alternative ways of making eligibility decisions are discussed in Chapter VI.

Along with other students who had been referred, Ricky's name was included for staffing on September 25. Approximately two weeks will have elapsed since the initial referral was completed. This is the maximum time which should be used for data gathering during problem selection.

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*E.g., the State of Connecticut has legislated that Student Support Teams be operationalized in every school in the state.

STAFFING REQUEST FORM ⑧

Directions: Circulate this form to all members of the Student Support Team (SST). All students who have been referred should be discussed within two weeks of initial referral.

To: Members of Student Support Team

From: SST Chairman*

September 19
Date

Please list the names of all students for whom referrals have been received since our last meeting.

Also list the names of any teachers who have requested (or are receiving) consultative service for students in their classrooms.

John L. Grade 1 Ms. T. Grade 6

Anne A. Grade 4

Ricky J. Grade 3

Do you know of any students whose program should be reviewed or evaluated? Please list below.

None at this time.

The SST will convene in the resource room at 7^{30} AM (time) on September 25, 1975 (date).

Return this form to the SERT prior to the meeting.

---

*We recommend that the SERT chair this team.

⑨ Priority Ranking Form

In order to determine which behaviors are judged to need immediate attention by parents, student, teachers, and others responsible for providing services to the student, each person is asked to list those behaviors and to rank them in terms of importance. Estimates of acceptable performance levels are also solicited.

After everyone concerned has completed the form, differences in priorities will more than likely be evident. How are these differences reconciled? Three approaches are possible:

1. "Eyeball" the data and identify those behaviors for which there appears to be the most agreement.
2. Sum up all the scores for each behavior and then average them.
3. Select the median number among those given for each behavior.

What is important is not the method of ranking the behaviors of interest but, rather, the input from all concerned parties in selecting the problems for program modification.

A priority form completed by Ricky's teacher is shown here. The priorities of all other parties to this referral are summarized in Case Report Summary One, which follows.

EXAMPLE OF A PRIORITY-RANKING FORM ⑨

Directions: May be attached to referral form. Ask each person concerned with student to complete a form. Items may be listed by the SERT or each person may generate his/her own list.

Referee: Ricky Age/Grade: 9/Gr. 3 Date: 9/12/75

Name of person completing this form: Ms. B./Classroom Teacher

Specify those goal (terminal) behaviors which you would most like to see attained through program modification.

Academic

Rank		Acceptable Level of Performance
1	Reading	1 yr. below grade level
3	Spelling	75% correct
4	Math	75% correct
5	Handwriting	faster and legible

Social

2	Noise	none
2	Fights	none

After you complete your list, rank order the list in terms of those most requiring immediate attention.

⑩ Case Report Summary

This is the first of the Case Report Forms the SERT completes during the program modification. The interview and priority-ranking data are summarized on it. The report form is used in the staffing session. It also becomes part of the permanent record of the activities initiated to develop an individualized program plan for the student.

CASE REPORT SUMMARY ONE ⑩

Ricky J.	3	9	Ms. B.
Student	Grade	Age	Teacher

I. PROBLEM SELECTION

1. Who owns the problem?
   Are the problems those that teache /parent/student/others identify?
   What are priorities?

Summarize interview data here.

Are the problems those the teacher identifies? Ms. B. is definitely interested in Special Education service for Ricky. His performance is poor in all subjects. He fights a lot, is disruptive and hyperactive. He is more difficult than most.

Are the problems those the parent identifies? Parents feel Ricky is not all that different from their other kids. They think he just needs more time to get his work done. They are willing to help in any way possible.

Are the problems those the student identifies? Ricky says he has "problems" in reading and math. He doesn't like anyone in his class and thinks teacher doesn't smile enough. He likes cars and models and would try harder in reading if he could play cars in school.

Other Comments: Principal: Ricky is high priority student for service. Complete assessment as quickly as possible. Social worker: Ricky needs lots of help getting along with other kids.

Summarize the priority rankings here.

*Behaviors	TEACHER	PARENT	STUDENT	OTHER* Social Worker	[✓ MEDIAN] OR AVERAGE
Reading	1	1	1		1
Math	3	2	2		2
Spelling	4	3	3		3
Handwriting	5	4	4		4
Social	2	5	5	1	3.5

*These are different for each student.

Chapter V

PROBLEM SELECTION: MEASUREMENT

Decision Area:
Problem Selection

Program Phase:
Initial Assessment

Contents

Overview
Matrix questions
Implementation

Overview

To measure social behavior, the SERT observes in Ms. B.'s classroom over a period of days and counts the frequency with which Ricky and his peers (and, in some instances, the teacher) engage in the social behaviors that are of concern. Ms. B. has noted that Ricky is "always" in the middle of a fight and is very inattentive and disinterested in academics. How accurate are these statements? How much more frequently does Ricky engage in these behaviors than his peers? Due process protections require that the factual basis of discrepancies be established. Classroom observation by the SERT of the social and task behaviors of Ricky and his peers provide the objective data needed to evaluate the problem.

In addition, over a period of five to seven days the SERT will assess Ricky's progress and performance on those academic curriculum requirements which have been pinpointed as high priority for intervention by concerned persons. Data will be collected on progress and performance in the curriculum which is used by Ms. B. in the classroom for Ricky and for the students in the class who are judged to be "average."

In addition to case report summaries (see Appendix B for the entire set of suggested case report forms) which become part of the targeted student's individual program plan and are a permanent record of all actions initiated for him,[1] the SERT summarizes the results of the classroom observations and academic assessments on a Discrepancy Ratio Worksheet (see p. 112).

All the behaviors for which data have been collected for the referral are listed on this worksheet. The SERT computes and enters the discrepancy ratios for these behaviors on the worksheet. They too become part of the permanent record.

There are reviewed in this chapter the measurement procedures which are used to identify desired and actual progress and performance of Ricky and his peers for six academic behaviors and four social behaviors identified during the communication and collaboration phase of problem selection. These behaviors are as follows:

Academic

Progress

1. Reading in the Read Series.
2. Phonics Skill Sequence.

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[1] See P.L. 94-142 regarding requirements for individual program plans for all identified handicapped students.

3. Math Computation Skill Sequence.

Performance

1. Spelling.
2. Math Facts.
3. Handwriting.

Social

Performance

1. Noise.
2. Out of Seat.
3. Physical Contact.
4. Off Task.

PROCESS: Measurement

DECISION AREA: Problem Selection
PROGRAM PHASE: Initial Assessment

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
2. Is there a discrepancy between desired and actual performance?	Curriculum materials used in referred student's class.	
Are there desired academic progress expectations?	Procedures to collect data on desired progress for average students. ①*	Collect data on desired progress for average students. ①
Are there desired academic performance expectations?	Procedures to collect data on desired performance for average students. ③	Collect data on academic performance of average students. ③
Are there desired expectations for social behavior?	Procedures to collect data on social behavior of average students. ⑤	Collect baseline data on social behavior of average students. ⑤
What is the target student's actual level of academic progress?	Procedures to collect data on actual academic progress of target student. ②	Collect baseline data on academic progress of target student. ②
What is the target student's actual level of academic performance?	Procedures to collect data on actual academic performance of student. ④	Collect baseline data on academic performance of target student. ④
What is target student's performance in social behavior?	Procedures to collect data on social behavior of target student. ⑤	Collect baseline data on target student's social behavior. ⑤
What is the discrepancy ratio?	Procedures to graph data on desired and actual progress/performance. ⑥ Procedures to compute discrepancy ratios. ⑦	Appropriately title and label graphs. Plot data on graphs. ⑥ Compute discrepancy ratio and record on worksheet. ⑦
Is there data on past progress/performance?	Cumulative folder data. ⑧	Summarize data pertinent to present priorities and problems. ⑧ Summarize data on Case Report Summary Two. ⑨

* Circled numbers are keyed to sections of chapters.

① Determining Desired Academic Progress

Progress measures focus on the time it is taking a student to master an ordered set of instructional objectives for a particular curriculum (see Chapter III). The rate at which "average" students master these objectives represents *desired progress*. The procedures for obtaining this information are detailed in the following steps:

STEP 1 *Determine criteria for desired progress.*

a. The best method for determining the progress that is desired for average students in a particular class in a particular school building is to ask the teachers. Generally, they can specify the minimum expectations for students who have been identified as progressing at an average rate in the curriculum of interest. The specifications should be in the form of a list: the sequence of objectives (ordered according to complexity) and the approximate completion date for each.

b. If the teachers cannot agree on or are unwilling to specify progress expectations for average students, then the criteria established by the school district for minimum progress requirements should be used.

c. If minimum progress expectations for average students cannot be obtained from the teachers or the school district, use the criteria for progress which have been established for the curriculum of interest by the curriculum developers (e.g., scope and sequence charts published for a reading series), if such information is available.

STEP 2 *Select and label the progress graph.*

a. Depending on the length of the curriculum (i.e., 1 year, 2 years, 6 years, etc.) select the appropriate progress graph and mark the abscissa in equal time units (see Graph 1, Chapter III).

b. On the ordinate, list the sequence of material or objectives through which children are expected to progress (as determined by the criteria obtained for the particular curriculum) according to the month and year in which the average student is expected to complete each unit of the material.

c. Draw a diagonal line through the intersecting graph lines, from left to right to represent average progress through the period of the curriculum.

APPLICATION Examples A, B, and C show the application of the procedures discussed in Steps 1 and 2 to three curriculum sequences at River Run School by the classroom teachers and the SERT. The curricula are the Read Series, Phonics, and Math. Graphs 12a, 13a, and 14a have been labeled to show the desired progress for each sequence.

EXAMPLE A: Determining Desired Progress, Read Series, River Run School

STEP 1 *Determining criteria for desired progress.*

The mastery sequence for the Read Series (Fig. V-1) is based on the publisher's estimates for completion of each book. This sequence was adopted to estimate progress for the average students because, over the years, the teachers had observed that average students completed the books at approximately the suggested rate.

STEP 2 *Selecting and labeling the progress graph.*

a. Since the curriculum takes an average of six years to complete, a six-year progress graph was selected by the SERT.

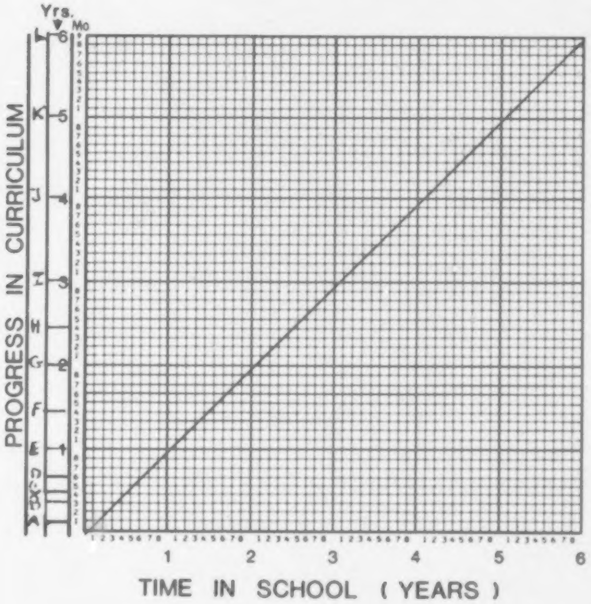
b. The SERT labeled the ordinate axis with each book/level initial at the month indicated for mastery (Fig. V-1), and the abscissa, with the school months and years.

c. Since average progress is one month of progress for one month of time in school, a straight line was drawn through the intersections of the horizontal and vertical lines from the lower left-hand corner of the graph to the upper right-hand corner. The result is shown in Graph 12a.

Grade 1:	Approximate Completion Date	Pages
And So You Go	October 1	64
Be on The Go	December 1	72
Can You	January 15	100
Days and Ways	March 1	190
Each and All	June (End of School)	222
Grade 2:		
Far and Away	January 1	252
Gold and Silver	June (End of School)	282
Grade 3:		
High and Wide	January 1	295
Ideas and Images	June (End of School)	296
Grade 4:		
Joys and Journeys	June (End of School)	406
Grade 5:		
Kings and Things	June (End of School)	406
Grade 6:		
Launchings and Landings	June (End of School)	438

Fig. V-1. Expected progress for average students for Read Series (American Book Co., 1968), River Run School.

STUDENT: Average SCHOOL: River Run CURRICULUM Read Series



Graph 12a. Six-year graph showing expected progress for average students for Read Series (American Book Co., 1968), River Run School.

EXAMPLE B: Determining Desired Progress, Phonics Skill Sequence, River Run School

STEP 1 *Determining criteria for desired progress.*

The progress sequence for phonic skills (Fig. V-2) is adapted from the Gallistel-Ellis Reading and Spelling Sequence (Note 1). The teachers decided upon the number of skills to be mastered each year and the mastery dates according to the phonic skill sequence in the Read Series.

STEP 2 *Selecting and labeling the progress graph.*

a. Although the curriculum is only four years in length the SERT used a six-year progress graph to match the reading graph.

b. The numbers representing cumulative skills were placed on the ordinate at the months and skills at which the average student is expected to have mastered these skills.

c. The average desired progress line was drawn through the intersections of the time-of-mastery and time-in-school lines for the four years of the curriculum sequence; average desired progress = one month of progress for one month of time in school.

GRADE 1

1. CVC (a)
(b,s,f,m,t)

2. CVC (a)
(h,j,n,p,l)
(b,s,f,m,t) Oct. 1

3. CVC (a)
(r,hard-g,d)

4. CVC (a)
(hard-c,k,ck,nd,
w,qu) Nov. 1

*5. CVC (a)
(All single
consonants
except v,y,x,z) Dec. 1

6. CVC (i)
(b,c,d,f,g,h,j,
k,l,m,n,p,r,s,
t,v,w,x,y,z;ck) JAN. 1

*7. CVC (a-i)
(all single
consonants)

8. CVCC (a-i)
(ck,ss,ff,ll,zz) Feb. 1

9. CVCC (a-i)
(ing,ang,ink,
ank)

10. CCVCC (a-i)
(sh,th,ch,wh,
ck,ng,nk) Mar. 1

11. CVC (o)
(all single
consonants)

*12. CVC (a-i-o)
(all single
consonants) April 1

13. CVCC (o)
(ck,ll)

14. CVCC (o)
(st,ff,ft,ng,
th,ss) May 1

15. CVC (a-u)

16. CVC (a-e)

17. CVC
(a-e-i-o-u) June 1

GRADE 2

18. CCVCC (a-i-o)
(beg. blends:
st,sc,sp,sk,sl,
sw,sn,sm,bl,cl,
fl,gl,pl,sl,br,
cr,dr,fr,gr,pr,
tr,thr,shr,sw,tw,
dw,qu,kw)
(diagraphs:ch,sh,
th,wh)
(ending blends:
ll,ck,ss,nk)

19. CCVCC (a-i-o)
(beg. blends:
scr,spr,squ,str,
spl)
(ending blends:
ng,sh,ll,nk)

20. CVCC
(a,e,i,o,u) JAN. 1

21. y and e
(at the end of
one syllable
words)

22. Magic e
(single
consonant)

23. Magic e
(double
consonant

**24. Soft c and g;
(tch,dge,ge,
nge,ce,nce:
se'z) June 1

GRADE 3

25. CVVC
(ai,ay,ow,oa
oe,ee,ea,ui
ue,ie,igh)

26. CCVVC
(ai,ay,ow,oa,
oe,ee,ea,ui
ue,ie,igh)

27. CVVC
(oo,ou,ow,au,
aw,oi,oy,ew,
eu,all,alk) JAN. 1

28. CCVVCC
(oo,ou,ow,au,
aw,oi,oy,ew,
eu,all,alk)

29. r with short
vowels

**30. r with long
vowels

31. CCVVCC
(ie,ea,neigh,
augh,ind,ild
old)

32. (wr,ph,kn,gh,gn) June 1

GRADE 4

33. Closed syl-
lables with
y and (c)
le endings
and with
2nd closed
syllables

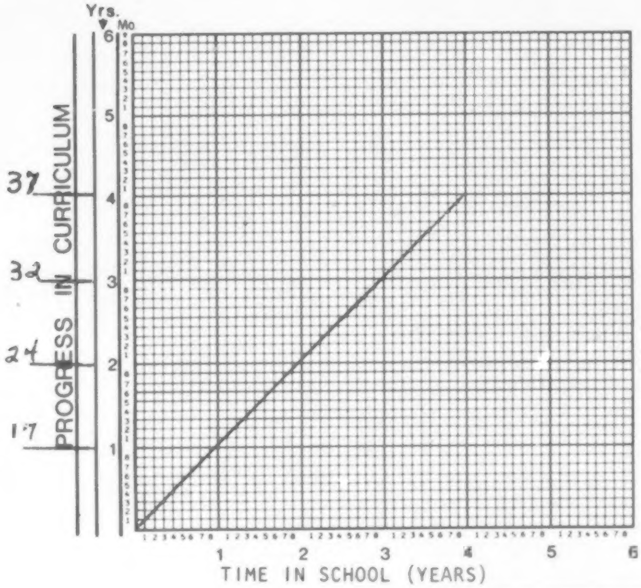
34. Two closed
and open syl-
lables with
y,ly,le,s,
es,ed,er,
est,ing JAN 1

35. Soft c and
g in two
syllable
words

36. Prefixes:
(a,al,ad,de,
ex,in,re)
Suffixes:
(ar,er,or,
tion,sion,
ness,ment)

37. Multisyl-
lable words June 1

Fig. V-2. Expected progress for average students in phonics skill sequence, grades 1-4, River Run School. (Adapted from "Phonetically regular words [for use in teaching and testing both reading and spelling]" by B. Gallistel & E.K. Ellis, *Reading and spelling categories.* Minneapolis, Minn.: Department of Psychoeducational Studies, University of Minnesota, 1970.)



STUDENT: Average
SCHOOL: River Run
CURRICULUM: Phonics

Graph 13a. Progress graph for average students for 4-year phonics sequence, River Run School.

EXAMPLE C: Determining Desired Progress, Math Sequence, River Run School

STEP 1 *Determining criteria for desired progress.*

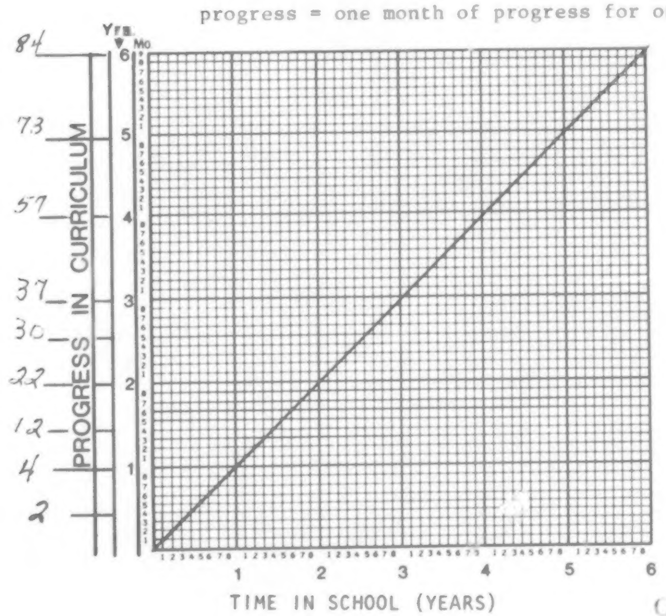
The progress sequence for math computation skills shown (Fig. V-3) and the approximate dates for completion had been derived by the teachers during a series of weekly meetings.

STEP 2 *Selecting and labeling the progress graph.*

a. For a six-year sequence, the SERT selected a six-year progress graph.

b. The numbers representing cumulative skills were placed on the ordinate at the month and year at which the average student is expected to have mastered these skills.

c. The average progress line was drawn through the time-of-mastery and time-in-school lines for the six years of the curriculum sequence; average progress = one month of progress for one month of time in school (see Graph 14a).



STUDENT: Average
SCHOOL: River Run
CURRICULUM: Math Computation Sequence

Graph 14a. Six-year progress graph for Math Computation Skills, River Run School.

Grade 1

1. Add two one-digit numbers; sums 0 + 0 to 9 + 0
2. Add two one-digit numbers to sum exactly ten

JAN.1

3. Subtract one-digit number from one-digit number: 0 - 0 to 9 - 9
4. Subtract 0 through 10 from 10: 10 - 0 to 10 -10

JUNE 1

Grade 2

5. Add three one-digit numbers; sums 0 + 0 + 0 to 9 + 0 + 0
6. Add two one-digit numbers to sums of 11 through 19
7. Add three one-digit numbers to sum 10 through 19
8. Add tens from 10 + 10 to 90 + 10
9. Add a one-digit number to a two-digit number without carrying
10. Add a two-digit number to a two-digit number without carrying
11. Add three two-digit numbers without carrying
12. Add a one-digit number to a two-digit number; sums 10 through 18; without carrying

JAN.1

13. Add a two-digit number to a two-digit number with carrying from ones column
14. Add three two-digit numbers with carrying from ones column
15. Add two tw-digit numbers; carrying from tens column
16. Add two two-digit numbers; carrying from ones and tens column
17. Subtract one-digit number from two-digit number without borrowing combinations of 11 through 18 (11 - 2 to 18 - 9)
18. Subtract combinations of tens: 10 - 10 to 90 - 90
19. Subtract one-digit number from two-digit number, remembering to bring down the one in the tens column: 11 - 1 to 19 - 9
20. Subtract two-digit number from two-digit number without borrowing
21. Subtract one-digit number from two-digit number with borrowing
22. Subtract two-digit number from two-digit number with borrowing

JUNE 1

Grade 3

23. Add three two-digit numbers; carrying from both ones and tens column
24. Add hundreds: 100 + 100 to 900 + 900
25. Add two three-digit numbers without carrying
26. Add three three-digit numbers without carrying
27. Subtract two-digit number from three-digit number with borrowing from hundreds column (only)
28. Subtract two-digit number from three-digit number with borrowing from tens column (only)
29. Subtract hundreds from hundreds: 100-100 to 900-900
30. Subtract three-digit number from three digit number; no borrowing
31. Multiplication Facts - 2's

FEB.1

32. Multiplication Facts - 3's
33. Review Goal
34. Multiplication Facts - 4's
35. Multiplication Facts - 5's
36. Review Goal
37. One Place Multiplier - 2 place multiplicand no carrying

JUNE 1

Grade 4

38. Add two three-digit numbers with carrying from ones column only
39. Add two three-digit numbers with carrying from tens column only
40. Add two three-digit numbers with carrying from both ones and tens columns
41. Subtract three-digit number from three-digit number; borrowing from tens column only
42. Subtract three-digit number from three-digit number; borrowing from from hundreds column only
43. Subtract three-digit number from three-digit number; borrowing from tens and hundreds columns
44. One place multiplier - 2 place multiplicand carrying in hundreds column
45. One place multiplier - 2 place multiplicand carrying in tens column
46. One place multiplier - 3 place multiplicand carrying in tens column
47. One place multiplier - 3 place multiplicand carrying in hundreds column
48. One place multiplier - 3 place multiplicand carrying in tens and hundreds column
49. Two place multiplier - 2 place multiplicand no carrying
50. Two place multiplier - 2 place multiplicand no carrying
51. Two place multiplier - 3 place multiplicand no carrying
52. Multiplication Facts - 6's
53. Multiplication Facts - 7's
54. Review Goal
55. Multiplication Facts - 8's
56. Multiplication Facts - 9's
57. Review Goal

Grade 5

58. Two place multiplier - 2 place multiplicand carrying in tens column
59. Two place multiplier - 3 place multiplicand carrying in tens column
60. Division Facts - 2's
61. Division Facts - 3's
62. Review Goal - 2's and 3's
63. Division Facts - 4's
64. Division Facts - 5's
65. Review Goal - 4's and 5's
66. Division Facts - 6's
67. Division Facts - 7's
68. Review Goal - 6's and 7's
69. Division Facts - 8's
70. Division Facts - 9's
71. Review Goal - 8's and 9's
72. Two as divisor - 3-digit dividend
73. Two to nine as divisor - 3-digit dividend

Grade 6

74. Three place multiplier - 3 place multiplicand carrying in tens and hundreds column
75. Three place multiplier - 3-4 place multiplicand - 0 in tens column in multiplier
76. Two as divisor - 2 digit dividend with remainder
77. Two to nine as divisor - 2 digit dividend with remainder
78. 1-digit divisor - 3-digit dividend with remainder
79. Two and three-digit quotient with zero
80. Tens as divisor - with no remainder
81. Tens as divisor - with remainder
82. Two-digit divisor - three or four-digit dividend without remainder
83. Two-digit divisor - three or four-digit dividend with remainder
84. Three-digit divisor - three or more-digit dividend with remainder

Fig. V-3. Expected progress for average students in math computation skills, grades 1-6, River Run School.

② Determining Actual Progress of Target Student

After the desired progress in the school curriculum of interest has been established, the SERT must determine the target student's mastery level for this curriculum. Here are the procedures for obtaining this information.

STEP 1 *Select material.*

From the books used in the curriculum, select at least three but preferably more samples of material at each level which the target student's average classmates have mastered at the time of testing.

STEP 2 *Collect the data.*

a. Beginning with selections from the highest mastery level achieved by the target student's average classmates, present the three or more samples to the student.

b. For each sample, record the student's frequency and accuracy of responses.

c. Count the frequencies of correct and incorrect responses to all the samples.

STEP 3 *Summarize the data.*

a. Put the frequency scores in order, from low to high.

b. Determine the median scores for correct and incorrect responses.

STEP 4 *Determine mastery and instructional level.*

a. If the target student's median scores meet the established criteria for mastery, present samples to him from successively higher levels of the curriculum until he reaches his instructional level.

b. If the median scores do not meet the established criteria for mastery at the level sampled, continue to sample at successively lower levels until mastery level is achieved and instructional level can be identified.

c. The instructional level is one level above the mastery level. For some students, this level is the "frustration level," that is, the point at which the student becomes frustrated and does not learn. Whenever a "frustration level" is encountered, begin instruction at the highest mastery level and sample frequently from the next higher level until the student can move into it without frustration.

STEP 5 *Plot mastery level for target student and average peers on the progress graphs.*

The target student's mastery level is plotted on the graph with a ○ at the intersection of the mastery level on the vertical axis and the current school year and month on the horizontal axis. A △ is plotted on the same graph to show the desired progress for the student (equivalent to expected progress for the student's average classmates at the same point in time). Thus far the two points are on the same vertical line.

STEP 6 *Draw a nonintervention progress line.*

What will be the target student's mastery level at the completion of six years of school if no instructional intervention changes his present rate of progress?

The answer can be demonstrated graphically by estimation or projection. Using an equally spaced broken line, connect the point representing current mastery level to the zero point (left-hand lower corner) of the graph; then, without changing the angle, carry the line out to the vertical line representing the ninth month of the sixth year. This dotted line shows the progress that can be anticipated for the target student if no intervention is planned and implemented.

APPLICATION

There follow three examples (A1, B1, C1) of the application of these procedures by the SERT to the assessment of Ricky's mastery levels in the Read Series (American Book Co.), phonics skill sequence, and math skill sequence.

EXAMPLE A1: Determining Ricky's Progress in the Read Series

STEP 1

Selecting the material.

a. The SERT chose three selections at random from each third of every book in the Read Series through the third grade. Each selection was 150-200 words in length.

b. Five comprehension questions were written for each selection using who, what, when, where, why, and how questions. A sample reading selection and questions are shown in Fig. V-4.

STEP 2

Collecting the data.

a. The SERT identified Book G as the highest mastery level which Ricky would have achieved if he were progressing as desired (see Graph 12a).

b. Ricky was asked to read the three selections from this level; for each selection, the SERT timed him for one minute and recorded correct and incorrect responses.

c. For each selection, Ricky was asked the five previously selected comprehension questions. The SERT recorded correct and incorrect responses.

STEP 3

Summarizing the data.

a. The SERT totaled the number of correct and incorrect words read/minute for each selection.

b. The number of comprehension questions answered correctly was totaled and the percentage found, as follows:

$$\frac{\#\text{ of questions answered correctly}}{\text{total }\#\text{ of questions}} = \%\text{ correct}$$

c. The data for the selections were ordered from high to low and the medians were selected. These are Ricky's reading and comprehension scores for the Read Series.

STEP 4

Determining mastery and instructional levels.

The criteria established at River Run School for determining mastery, frustration, and instructional levels for grades 1-3 and grades 4 and above follow Figure V-4.

Level C
Total Words = 168
Score Norm = Not more than 2 errors

"BUGS"

Bud ran up to Hal and said, "What are you 10
doing?" 11
"I am trying to see if I can get a bug," 22
Bud said. 24
"A bug?" said Bud. "What for?" 30
"Not a bug," Hal said, "Bugs! I need a lot 40
of them." 42
"You do? Why?" said Bud. 47
And Hal said, "I need bugs so I can go 57
fishing." 58
"May I go fishing with you?" said Bud. 66
"You may if you can get the bugs," Hal said. 76
We need a lot of them." 82
So Bud sat with Hal. He was trying to get 92
bugs to go fishing. 96
"Say! Bud said. "This is fun! 102
Trying to get bugs for fishing!" 108
"You said it!" said Hal. 113
"I got a bug!" said Bud. 119
"I got a bug!" 123
"Show it to me!" said Hal. 129
He saw it and then he said, 136
"That is not a bug." 141
"It is so a bug," Bud said. 148
"It is not," said Hal. 153
"I know a bug when I see a bug. 162
And THAT is not a bug." 168

Comprehension Questions

What did Bud ask Hal?
("What are you doing?")

What did Hal say he was doing?
("Trying to see if I can get a bug.")

How many bugs did Hal need?
(A lot of them.)

Why did Hal need bugs?
(So he could go fishing.)

How do you know that Bud wanted to go fishing with Hal?
(He asked Hal if he could go along.)

What did Bud have to do so that he could go fishing with Hal?
(Help get bugs.)

What did Hal want to see?
(Bud's bug.)

What did Hal and Bud argue about?
(Whether Bud really had a bug.)

Fig. V-4. A randomly selected sample from Level C, Read Series (American Book Co., 1968), and comprehension questions.

Medians: Grades 1-3

Frustration Level	Instructional Level	Mastery Level
29 words/min. or less and/or less than 80% comprehension and/or 8 or more errors/min.	30-49 words/min. & 80% comprehension and/or 3-7 errors/min.	50 words/min. & 80% comprehension & 2 or fewer errors/min.

Medians: Grades 4 and Above

Frustration Level	Instructional Level	Mastery Level
49 words/min. or less and/or less than 80% comprehension and/or 8 or more errors/min.	50-99 words/min. & 80% comprehension and/or 3-7 errors/min.	100 words/min. or better & 80% comprehension & 2 or fewer errors/min.

The rates used are based on minimum guides to decision making in oral reading established by Starlin and Starlin (1974) through observation of public school children of all ages. Criteria for mastery also may be determined by sampling the performances of average readers from each grade in grade-level reading material.

Ricky did not reach mastery level in selections from Book G and, therefore, the SERT continued to sample at successively lower levels in the Read Series. In Book C, Ricky reached mastery level in the first two selections and instructional level in the third selection. It was decided to place him at page 60 of the C book (approximately two-thirds of the way through) rather than to begin with Book D, however, since his error rate in Book D was more than 8 per minute (frustration level).

STEP 5 *Plotting mastery level on the graph for target student and peers.*

Ricky's mastery level was plotted on the graph with a ◯ at the intersection of the lines representing approximately two-thirds of Book C on the vertical axis (4 months of grade one) and the beginning of month one of third grade on the horizontal axis.

Desired progress for Ricky was plotted on the graph with a Δ at the intersection of the lines representing beginning of month one of third grade on both the vertical and horizontal axes.

STEP 6 *Drawing the nonintervention progress line.*

The broken line in Graph 12b as drawn by the SERT, represents Ricky's projected mastery level at the completion of six years of school if no instructional intervention were to change his present rate of progress. The last point intersects the last line of the graph at one year and 3 months of progress (12 months).

EXAMPLE B1 Determining Ricky's Actual Progress
in the Phonics Skill Sequence

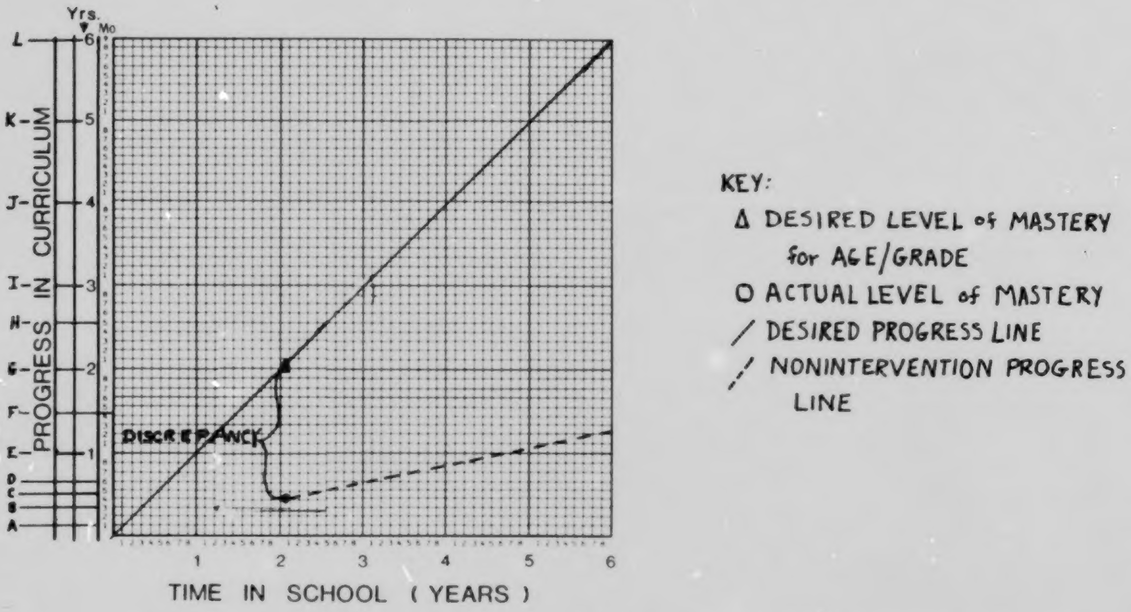
STEP 1 *Select the material.*

a. The SERT prepared three selections of 100 items or more in length comprising approximately equal numbers of words from the third-grade categories of the skill sequence and each category preceding it. Samples of items from categories 1, 2, and 3 (see Fig. V-2) are shown in Figure V-5.

STEP 2 *Collect the data.*

a. The SERT identified category 24 as mastery level for Ricky were he

STUDENT: RICKY SCHOOL: RIVER RUN CURRICULUM: READ SERIES



Graph 12b. Actual mastery level, estimated nonintervention progress line, and desired progress for target student in Read Series (American Book Co., 1968), River Run School.

lab	tam	Sam	bat	mat	5
fat	bat	fat	tab	tam	10
bam	sat	mat	bam	sat	15
mat	tab	mam	sat	bam	20
mam	fam	fam	fab	sab	25
nab	pal	nap	nat	pat	30
ham	lap	sap	map	jab	35
sap	bam	lab	lab	man	40
hat	fan	pan	jam	tap	45
lan	nat	ban	nan	Pam	50
nag	dad	Dan	dam	tag	55
rap	fad	rag	ram	gal	60
lag	gag	pad	mad	lad	65
had	rat	gap	ran	bag	70
tad	gab	lam	hag	dab	75

(The) lad ran (to) Dad.	5
Dan had a rag bag.	10
(The) bad rat sat (on) a hat.	17
Dan ran (to) fan (the) man.	23
Nat ran (to) (the) pan.	28
Pat (is) mad at (the) rat.	34
(The) rag bag has a gap.	40
Dad has a dap (of) ham.	46
Sam had a nap (on) (the) mat.	53

( ) indicates sight word

Fig. V-5. Samples of isolated words and words in context from categories 1, 2, and 3 in phonics skill sequence. The cumulative total words for each part are given in the right-hand column.

progressing as desired in the phonics sequence (see Graph 13a).

b. Ricky was asked to decode three selections from category 24 as the SERT timed him for one minute and recorded correct and incorrect responses.

STEP 3 *Summarize the data.*

a. The SERT totaled the number of correct and incorrect words decoded/minute for each selection.

b. The data for each selection were ordered from high to low and the medians were selected. The medians are Ricky's correct and incorrect rates/minute of decoding for category 24 of the phonics sequence.

STEP 4 *Determine mastery and instructional level.*

The criteria established at River Run School for determining mastery and instructional levels in phonic decoding skills are as follows:

Medians: Grades 1-3

Frustration Level	Instructional Level	Mastery Level
29 words/min. or less and/or 8 or more errors/min.	30-49 words/min. and/or 3-7 errors/min.	50 words/min. or better & 2 or fewer errors/min.

Medians: Grades 4 and above

Frustration Level	Instructional Level	Mastery Level
49 words/min. or less and/or 8 or more errors/min.	50-99 words/min. and/or 3-7 errors/min.	100 words/min. or better & 2 or fewer errors/min.

Ricky did not attain mastery level in category 24. Therefore, the SERT continued to sample from successively lower levels of the sequence. Ricky attained mastery level in category 17; thus, instructional level was determined to be category 18.

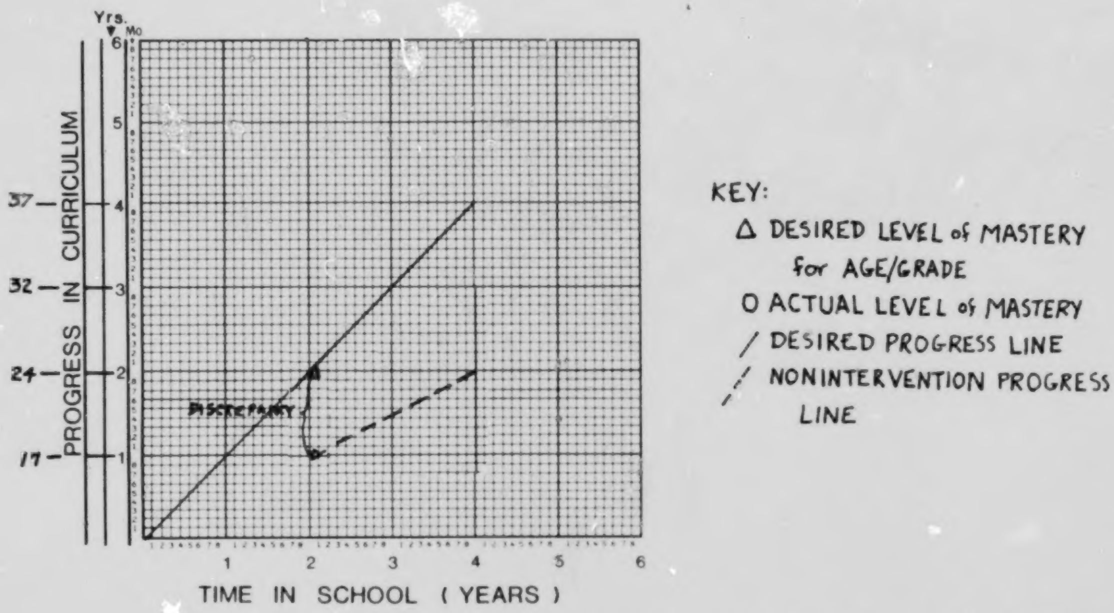
STEP 5 *Plot mastery level on the progress graph for Ricky and his peers.*

On a progress graph, the SERT plotted a ○ at the intersection of the lines representing category 17 (9 months of progress) on the vertical axis and month one of grade 3 on the horizontal axis, and a △ at the intersection of the lines representing month one of grade 3 on both axes (Graph 13b).

STEP 6 *Draw a nonintervention progress line.*

The nonintervention progress line, projected from Ricky's actual current mastery level, intersects the last line of the 4-year skill sequence at the point representing one year and 8 months of progress. The SERT concluded that without intervention, Ricky would master little more than 17 months of the phonics skill sequence during the elementary school years.

STUDENT: RICKY SCHOOL: RIVER RUN CURRICULUM: PHONICS SEQUENCE



Graph 13b. Ricky's actual mastery level in phonics skill sequence in relation to desired progress and estimated nonintervention progress.

EXAMPLE C1: Determining Actual Progress for Ricky in the Math Skill Sequence[2]

STEP 1 *Select the materials.*

a. The SERT prepared three sets of at least 25 problems for each category of the skill sequence. Each set included at least five problems from the target category and one problem from each of the preceding categories. A sample of the set for category 19 is shown in Figure V-6.

STEP 2 *Collect the data.*

a. The SERT identified category 22 as mastery level for Ricky were he progressing as desired in the math skill sequence (see Graph 14a).

b. Ricky was asked to write answers to three sets of problems from category 22 while the SERT timed him for one minute.

STEP 3 *Summarizing data.*

a. The SERT totaled the number of correct and incorrect digits written/minute in sequence. For example, in the problem 20 + 35, if the student responded 65, one digit would be counted as written correctly and one digit

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[2] While the Read Series approach is used to teach reading in the vast majority of elementary schools in the United States, math skills are more frequently assessed and taught using objectives in a skill sequence. Therefore, although it would be possible to randomly select math problems at each level of a basal math series, measure performance, and place the student at an instructional level in a graded math book, for present purposes we only determine progress in the skill sequence.

10 -10 (18)	35 +86 (16)	12 - 2 (19)	15 + 2 (12)	12 - 4 (17)	
45 +73 (15)	22 15 11 (11)	24 48 (13)	24 +34 (10)	15 + 4 (9)	6 +3 (1)
10 +30 (8)	9 -6 (3)	11 - 1 (19)	10 - 4 (4)	5 +8 (6)	18 - 5 (19)
15 - 3 (19)	45 24 13 (14)	5 6 4 (7)	5 0 2 (5)	15 - 4 (19)	5 +5 (2)

Fig. V-6. Random sample of five problems from category 19 and one problem from each preceding category.

as written incorrectly. If the student responded 50, the answer would be counted as no digits correct and 2 digits incorrect. In a problem such as 34 + 29, if the student's response were 63 and he had placed a 1 over the 3 to indicate carrying, the answer would be counted as three digits correct (the mark made to indicate carrying would also be counted as a digit).

This method of recording correct and incorrect responses in math is based on the work of precision teachers (Haughton, 1971). Recording movements/minute rather than number of total responses correct/minute decreases the risks associated with treating all problems as being of equal length and complexity when, in fact, the problems vary in the length of time needed for completion because of variations in the number of operations required and the number of digits in the written answer.

b. The total correct and incorrect responses for each set of problems were ordered from high to low and the medians were selected. The medians are Ricky's correct and incorrect rates/minute for computing math problems.

STEP 4

Determining mastery and instructional level.

Here are the criteria established at River Run School for determining mastery and instructional levels in math computation skills.

Medians: Grades 1-3

Frustration Level	Instructional Level	Mastery Level
0-9 digits/min. correct and/or 8 or more digits/min. incorrect	10-19 digits/min. correct and/or 3-7 digits/min. incorrect	20 or more digits/min. correct & 2 or fewer digits/min. incorrect

Medians: Grades 4 and above

Frustration Level	Instructional Level	Mastery Level
0-19 digits/min. correct and/or 8 or more digits/min. incorrect	20-39 digits/min. correct and/or 3-7 digits/min. incorrect	40 or more digits/min. correct & 2 or fewer digits/min. incorrect

Ricky did not achieve at mastery level in the category 22 problems. Therefore, the SERT continued to sample from successively lower levels in the sequence until Ricky achieved at mastery level in category 2. Instructional level was determined to be category 3.

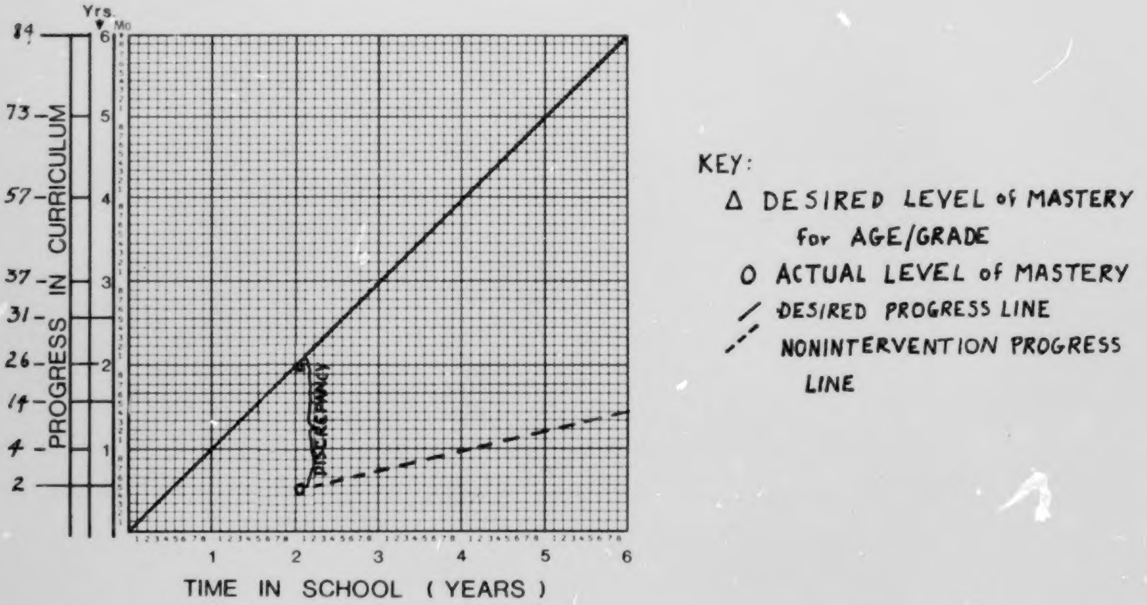
STEP 5 *Plot mastery levels for target student and peers on the progress graph.*

Using a O the SERT plotted Ricky's present mastery level at the intersection of the lines representing achievement of objective 2 (5 months of progress) on the vertical axis and beginning of third grade on the horizontal axis (Graph 14b).

STEP 6 *Draw the nonintervention progress line.*

Using Ricky's present mastery level as the focus, the SERT drew a projected progress line; it intersected the last line of the graph at one year and 5 months. The SERT concluded that if Ricky's present rate of progress were not altered by intervention, he would most probably achieve only 14 months of progress in the math skill sequence by the completion of six years of school.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Math Skills



Graph 14b. Ricky's actual mastery level of math skills in relation to desired level and estimated nonintervention progress.

Determining Desired Academic Peformance for Target Student ③

Performance measures, as discussed in Chapter III, focus on the individual level of proficiency in single tasks. Although performance on tasks may be stipulated by the culture, for school tasks we think it is preferable to determine desired performance on the basis of the median performance of average students in the particular class or school. The procedure for obtaining the information to determine the desired performance are described in the following steps.

STEP 1 *Select material for task in which performance will be measured.*

Three criteria govern the selection of performance tasks:

1. The task must be one that can be counted.
2. The task must be defined in specific enough terms to permit two independent observers to make counts and subsequently to demonstrate agreement.
3. The task must be one in which you would like the target student to perform at an average rate when the program modification is completed.

For example, in reading, you might wish to look at performance in reading the newspaper, since reading the newspaper represents a desired outcome of learning how to read. The performance task would be stated as follows: *# of words read orally/min. in newspaper.* In math, you might wish to assess performance in the computation of all types of computation problems, rather than in one particular type, because such performance is more likely to be the outcome behavior desired. The performance task would be stated as *# of math problems computed/min.* In sum, in selecting a task, the focus should be centered on changing the student's specific performance rather than on placement of the student in a particular category of an ordered sequence. It follows, then, that evaluation of success in program modification is based on the extent to which the student's performance on the target task is changing (increasing or decreasing) rather than on his mastery of a certain level of material in a sequence.

STEP 2 *Select "average" students.*

Ask the teacher(s) in the target student's class or grade to identify students who are performing at an average rate in the task or behavior of interest. From these students, randomly select a group, preferably, at least 8-10.

STEP 3 *Sample performance.*

Take a timed sample of the students' performances on the behavior of interest.

STEP 4 *Summarize data.*

a. For each student, count the number of correct and incorrect responses and divide by the length of the timed period to get the per minute rate. (A one-minute sample, of course, does not have to be divided.)

b. Order the individual rates from high to low and select the median number. This number is the median performance rate for all the sampled students and represents *desired performance* for the task in that classroom or school.

STEP 5 *Select and label the graph.*

a. On the equal-ratio graph, the vertical axis should be labeled "performances/min." On equal-interval graph paper, the vertical axis should be labeled, for example, "number correct/min.," "percent correct," "number completed," or the like, depending on the performance of interest. On both graphs, the dates on which measurements will be taken are placed on the horizontal axis.

STEP 6 *Draw desired performance line on the graph.*

a. Inasmuch as desired performance remains constant, it can be represented as a horizontal line across the graph; to make it distinctive, however, the line should be wavy 〰〰〰.

APPLICATION Three examples (D, E, and F) follow of the application of these procedures to determine the median performance levels of Ricky's peers in computing math facts, spelling, and handwriting.

EXAMPLE D: Determining Average Performance of Ricky's Peers in Computing Math Facts

STEP 1 *Select material.*

In reviewing the math sequence for grades 1 and 2, the SERT determined that by the beginning of grade 3, mastery of addition and subtraction math facts was essential. No information was available, however, on the rate of performance for average students. To determine the average rate of performance, the SERT prepared three sets of randomly selected addition and subtraction facts from the entire domain of addition sums for 0 through 19 and subtraction sums for 0-9. A sample of a set is shown in Fig. V-7.

STEP 2 *Selecting students.*

Upon the request of the SERT, each third-grade teacher named the group of students in his/her classroom who were assessed as performing at an "average" level in the computation of math facts. From this list, the SERT selected every fifth student until a group of 10 was formed.[3]

STEP 3 *Sampling performance.*

One of the three selections of math facts was distributed to each student, and the group was given three minutes in which to write answers.

STEP 4 *Summarizing the data.*

a. After collecting the papers, the facts summed correctly on each sheet were added up and divided by 3 minutes to obtain the per minute rate for each student.

b. These per minute rates were then listed from high to low. They were as follows: 10, 14, 18, 19, 19, 21, 22, 23, 24, and 25. Because there are 10 scores, the median falls between the fifth and sixth scores, that is,

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[3] The procedure depends upon the total number of classrooms and students available for sampling. For example, if there were only one third-grade classroom, the SERT might select every other student, every third student, or every fourth student from among those listed as average.

ADDITION AND SUBTRACTION FACTS

NAME____________________ DATE__________ PROBLEMS PER MINUTE______

9 -5	11 +6	4 -1	13 +6	7 -7	15 -7	5 +3	11 +4	7 -0	10 -4
5 -5	12 +4	5 -5	10 -6	9 +0	12 +7	9 +1	17 -8	8 +4	14 +8
3 +1	10 -5	7 +6	12 -5	8 +3	10 +9	3 -3	13 -7	9 +2	14 -5
6 +0	11 -5	0 +0	14 -7	4 +3	10 -1	3 +2	16 -8	3 -2	11 +7
8 +8	13 -8	4 -0	12 -8	5 +0	10 +2	9 -8	14 -9	8 +2	11 +2
7 -1	13 -5	9 +7	12 -9	4 +4	13 -4	9 +6	10 -7	6 +4	14 -6
9 -6	16 -9	8 +6	18 -9	8 +5	17 -9	6 +3	11 -9	8 +7	11 +8
7 +2	15 -8	7 +4	15 -9	8 +1	12 -3	6 -6	10 -8	16 -7	10 +3

Fig. V-7. Sample test of the computation of addition and subtraction facts, third-grade students, River Run School.

between 19 and 21. Thus, the median is 20.

STEP 5 *Selecting and labeling the graph.*

The SERT selected equal-interval graph paper and labeled the vertical axis, *# of addition and subtraction facts/min.* Dates were written along the horizontal axis to correspond with the beginning of the school year.

STEP 6 *Drawing the desired performance line.*

A wavy line ∿∿∿ was drawn across the graph at the line representing 20 addition and subtraction facts/min. (See Graph 15a.)

EXAMPLE E: Determining Average Performance for Ricky's Peers in Spelling

STEP 1 *Selecting material.*

At River Run School, as in most schools, a specific sequence of spelling skills has not been identified. For the weekly spelling tests, teachers prefer to select words from a wide variety of sources: students' writings, reading selections, social studies material, seasonal words, spelling "demons," and areas of student interest.

Ricky was referred for help with spelling because he was not succeeding on these tests and, when writing stories, was not spelling correctly. The SERT decided to determine desired performance for spelling by dictating to the students paragraphs comprising 75 words appropriate to first and second graders from "Dolch List of 220 Most Commonly Used Words"(Dolch, Note 2). Three such paragraphs were prepared by the SERT. (See Fig. V-8 for a sample of the words.)

a
and
big
blue
can
come
for
funny
go
I
in
is
it
jump
little
make
me
my
not

run
said
see
the
to
two
up
we
yellow
you
all
am
are
be
black
brown
but
did
do

four
get
good
have
into
must
new
out
pretty
ran
she
so
that
this
too
was
what
who
will

no
by
had
going
him
let
may
of
one
play
red
eat
an
as
us
old
any
now

Fig. V-8. A sample list of spelling words appropriate to first and second graders. Source: E. W. Dolch, "Dolch List of 220 Most Commonly Used Words." Champaign, Ill.: Garrard (no date).

STEP 2 *Selecting students.*

Fifteen third-grade students were randomly selected from a total of 75 third graders at River Run School who were identified as performing at an average level in spelling. The selected students were randomly distributed among three groups of five each.

STEP 3 *Sampling performance.*

One of the three paragraphs was dictated to each group at a normal speaking rate for a period of one minute. Students were instructed to write down as many words as they could in that time. In other words, instead of pacing the delivery of the words to some level which was comfortable for all students, the intention was to allow students to write as many words as possible.[4] This technique provides a truer picture of the number of letters in sequence which students can spell correctly than can be obtained with the more traditional approach.

STEP 4 *Summarizing the data.*

a. The number of letters in sequence spelled correctly was totaled for each student. When this method is used, although the word in its entirety may be spelled incorrectly, the student is given credit for any letters, beginning with the first, which are in the correct sequence. For example, if the word "f-u-n-n-y" is spelled "f-u-n-y," the student is credited with having spelled four letters correctly and one letter incorrectly (an omission). If the word had been spelled "f-o-n-n-y," the student would also be given credit for having spelled four letters correctly and one letter incorrectly (an error). Counting letters correct, instead of words, helps to reduce the error inherent in counting all words as being of equal length; some words take a considerably longer time to write than others.

b. The individual per minute rates of letters spelled correctly in sequence were ordered from high to low and the median rate determined as 30/min. correct and 5/min. incorrect.

STEP 5 *Selecting and labeling the graph.*

The SERT selected an equal-interval graph and labeled the vertical axis, *# of letters spelled correctly in sequence/min.*

STEP 6 *Drawing the desired performance line.*

Desired performance line was drawn as a wavy line across the graph to represent 30 letters spelled in sequence/min. (See Graph 16a.)

EXAMPLE F: Determining Average Performance of Ricky's Peers in Handwriting

STEP 1 *Selecting material.*

The decision on which material to use to assess handwriting depends upon the particular requirements of the school in which the student is enrolled as well as the student's age and developmental stage. Some possible choices are as follows:

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[4] See Starlin (1972) for the rationale for and a more detailed description of the procedure.

Manuscript Writing (usually, grades 1-3) or Cursive Writing (usually, grades 4 and above) of any of the following:

1. Copying letters of the alphabet or numerals in serial order.
2. Copying letters of the alphabet or numerals in random order.
3. Writing letters of the alphabet or numerals in serial order from dictation, i.e., without a visual match.
4. Writing letters of the alphabet or numerals in random order from dictation, i.e., without a visual match.
5. Copying words, sentences, or paragraphs.

The SERT elected to determine desired performance for copying a 100-150 word paragraph in manuscript writing (Fig. V-9) from the blackboard, as the task most closely resembled the classroom requirements for Ricky and the other students in his class.[5]

STEP 2 *Selecting students.*

Ten students were randomly selected from among the 50 third graders who were identified as average writers at River Run School.

STEP 3 *Sampling performance.*

Each student was given one minute to copy one of the three paragraphs which had been written on the blackboard in manuscript writing.

From:
Level H Read Series (American Book Co.)

Indian Messages

```
   The Indians sent signals with smoke.        (6)
    3          10    14      21   25     30
First they made a small fire and threw        (14)
   35    39    43 44    49    53   56    61
some grass over it.  The grass made the       (22)
   65    70    74 76    79     84   88   91
fire smoke.  When the fire was smoking,       (29)
   95   100    104 107  111 114        121
the Indian held his blanket over the          (36)
124      130   134 137       144  148  151
smoke.  By moving the blanket up and          (43)
   156   158     164 167     174 176 179
down, the Indian could make the smoke         (50)
  183   186      192    198  202  205   210
go up in long or short puffs.                 (57)
212 214 216  220 222   227     232
   All the people of the tribe knew           (64)
   235  238      244 246 249    254   258
the meaning of the different puffs of         (71)
261      268 270  273         282    287 289
smoke.  Some of the signals were              (77)
  294      298 300 303      310   314
danger or warning signals.  Others            (82)
   320 322       329     336       342
called a council meeting.  Still              (87)
   348 349     356      363     368
others called the tribes together for         (93)
   374      380 383     389       397 400
war.  Others told of peace.  This was        (100)
403        409  413 415  420      424 427
the Indians way of communicating             (105)
430      437 440 442             455
with one another.                            (108)
 459 462     469
```

Fig. V-9. Sample paragraph for average students to copy from blackboard to determine average no. of words/min. Numbers in parentheses are the word count; numbers under words are the letter count.

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[5] The appropriateness of such a task is not dealt with at this point but is reserved instead for the program-planning phase.

STEP 4 *Summarize the data.*

a. The number of letters written correctly by each student were counted. A letter was judged to be correct if the word in which it was written was legible to the reader. Third-grade teachers participated in the scoring of the paragraphs, and each paragraph was scored independently by at least two persons. In case of disagreements the lower number was selected.

b. The per/minute rates for each student were listed from high to low and the median was selected: 40 letters written/minute.

STEP 5 *Select and label the graph.*

The SERT selected an equal-interval graph and labeled the vertical axis *# letters written/min.*

STEP 6 *Draw the desired performance line.*

A wavy line was drawn across the graph at the line representing 40 letters written/min. on the vertical axis. (See Graph 17a.)

Determining Actual Performance of Target Student ④

After desired performance has been determined by sampling the performances of average students with appropriate materials, the target student's performance on the same task is assessed, using the same materials. Here are the procedures to follow.

STEP 1 *Select material.*

Use the material that is prepared to assess the performances of average students. It comprises tasks that represent terminal behaviors of interest to the people concerned with the referral.

Although, in this manual, we have stressed primarily academic and social behaviors as examples of performance tasks, it should be emphasized at this point that any performance task is "fair game" for discrepancy measurement as long as it is clearly defined and can be observed and measured. If a student has been referred because there is concern that he cannot read the want ads from the newspaper to find a job, then decoding want ads from the newspaper is the performance of interest. If interest is in car repair, then the length of time it takes an average student mechanic to repair something in a car is the performance of interest to which the target student's performance will be compared.

STEP 2 *Sample performance.*

Ask the student to perform the behavior of interest and record the frequency and accuracy of his responses. Obtain at least three different samples of performance from three different selections of material.

STEP 3 *Summarize data.*

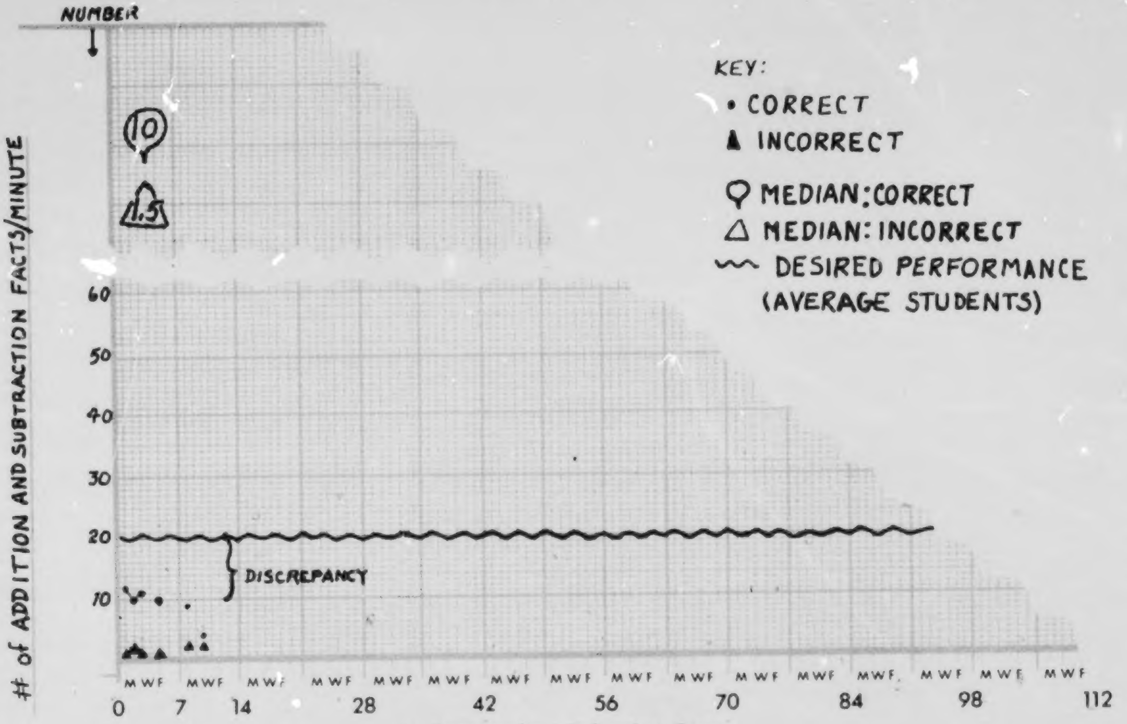
a. Count the number of correct and incorrect responses.

b. Order the scores from high to low and select the median.

STEP 4 *Plot performance data on the graph.*

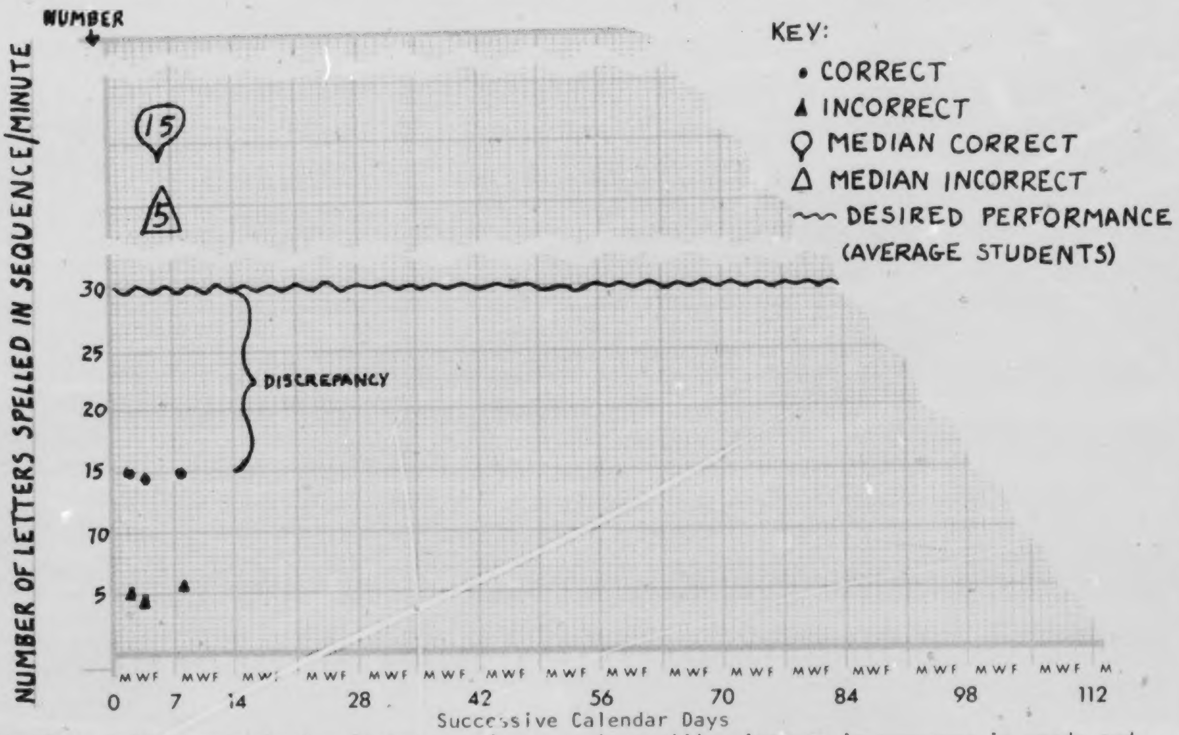
a. Plot the referred student's actual performance at the intersection of the lines that correspond to the calendar date (along the bottom) and the

STUDENT: RICKY SCHOOL: RIVER RUN CURRICULUM: MATH COMPUTATION

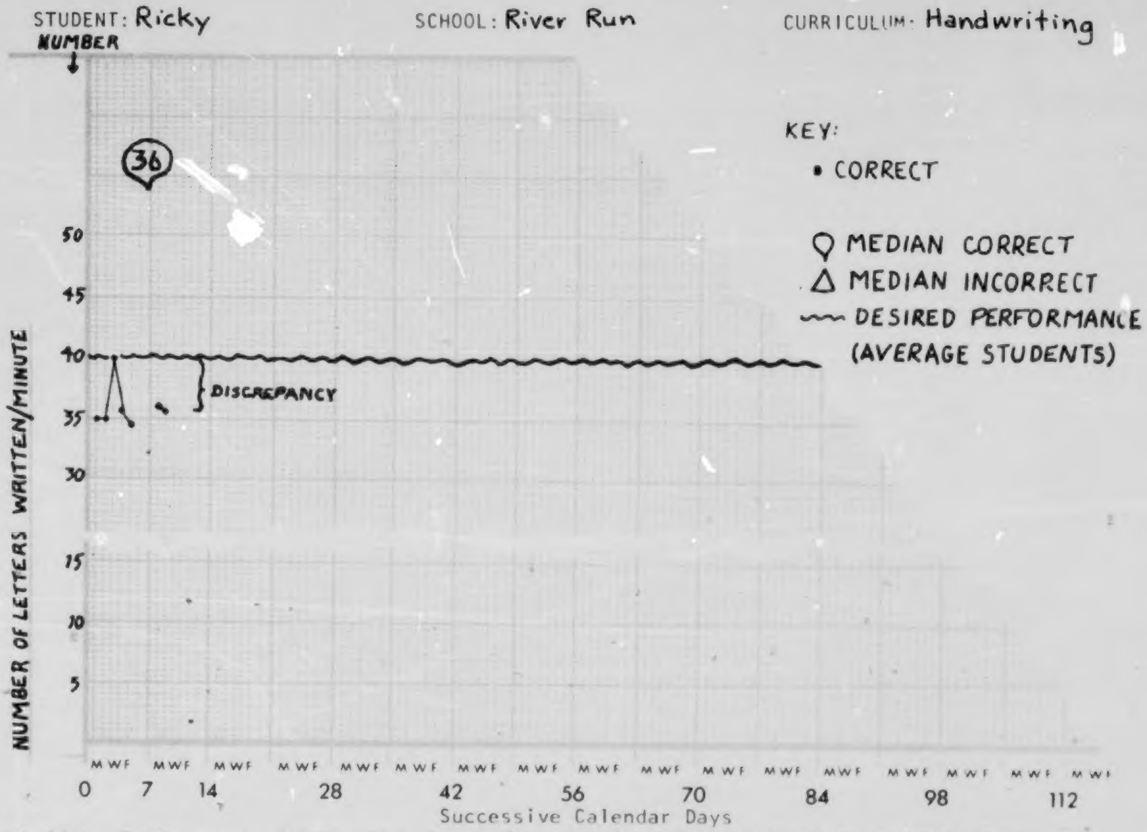


Graph 15a. Daily graph showing Ricky's performance in math computations and desired performance.

STUDENT: RICKY SCHOOL: RIVER RUN CURRICULUM: SPELLING



Graph 16a. Daily graph showing Ricky's performance in spelling letters in sequence in words and desired performance.



Graph 17a. Daily graph showing Ricky's performance in writing and desired performance.

level of performance (up the left side).

b. Plot both correct and incorrect performance the same way using different symbols (e.g., ○ = correct; Δ = incorrect)

c. Place the median correct score in a ⚲ above the data and the median incorrect score in a Δ above the data.

APPLICATION There follow three examples (D1, E1, F1) of performance measurement in which the SERT applied the above procedures to assess Ricky's performance in computing math facts, spelling, and handwriting. These behaviors were identified during referral interviews as priority concerns.

EXAMPLE D1: Determining Ricky's Performance in Computing Math Facts

STEP 1 *Selecting the material.*

The SERT had prepared three sets of randomly selected addition and subtraction facts to use in assessing the performance of "average" students (Fig. V-7).

STEP 2 *Sampling performance.*

Using the three sets of problems, the SERT sampled Ricky's performance, timing him for three minutes on each set.

STEP 3 *Summarizing the data.*

a. The SERT counted the number of correct and incorrect facts on each set and divided the totals by 3 minutes to obtain the per minute rate.

b. The scores/min. were ordered from high to low and the medians were selected as follows:

Correct: 4, 9, 10, 10, 11, 12 Median: 10

Incorrect: 1, 2, 1, 2, 2, 1 Median: 1.5

STEP 4 *Plotting the data for the target student on the performance graph.*

Using a ○ for correct and a △ for incorrect scores, the SERT plotted Ricky's data on the performance graph. The medians of the correct and incorrect scores were placed above the data (see Graph 15a).

EXAMPLE E1: Determining Ricky's Performance in Spelling

STEP 1 *Selecting the material.*

The same material which was used to assess performance in spelling by Ricky's peers was used to assess his performance levels. This material consisted of paragraphs containing samples of Dolch words from Levels 1 and 2 (Fig. V-8) which were dictated to the students at a normal speaking rate.

STEP 2 *Sampling performance.*

The SERT dictated the three paragraphs to Ricky at a normal speaking rate for periods of one minute.

STEP 3 *Summarizing the data.*

a. The number of letters spelled correctly and incorrectly in sequence/minute were totaled.

b. The correct and incorrect scores for the three paragraphs were ordered from high to low and the medians were selected as follows:

Correct: 14, 15, 15 Median: 15

Incorrect: 4, 5, 6 Median: 5

STEP 4 *Plotting data for target student on the performance graph.*

The SERT plotted the three correct scores, using the ○, and the three incorrect scores, using the △, on the performance graph. The medians were placed above the plotted data (Graph 16a).

EXAMPLE F1: Determining Ricky's Performance in Handwriting

STEP 1 *Selecting the material.*

The same material which was used to determine desired performance for average students was used by the SERT to assess Ricky's performance in handwriting. The number of samples was increased to seven, however, to provide a better data base.

STEP 2 *Sampling performance.*

The SERT asked Ricky to copy the sample paragraphs from the board for a period of one minute each.

STEP 3 *Summarizing the data.*

a. The number of letters written correctly/minute, using the criterion of legibility, was summed for each paragraph. Two paragraphs were scored by the classroom teacher as well as the SERT to establish scoring reliability

(95% in each instance).

b. The summed scores were ordered from high to low and the median was selected as follows:

Correct: 34, 35, 35, 36, 36, 37, 40 Median:

Incorrect: Not counted

What is the median number of letters written correctly/minute by Ricky? Check your answer below.[6]

STEP 4 *Plotting the target student's data on the performance graph.*

See Graph 17a. Are the seven data points plotted correctly? Is the median shown correctly?

Determining Performance Discrepancies in Social Behavior ⑤

Although discrepancy data can be used whenever a developmental sequence can be identified, many performance discrepancies are not easily placed in a sequential context, particularly those social behaviors that may mark a child in the classroom as "different." A child is more likely to be identified as socially discrepant if he displays social behaviors that are considered undesirable (particularly, "noise," "out of place," and "aggression") at frequencies that are greater than those desired by the classroom society. If possible, however, identification should be delayed until a more objective picture of the child's behavior in relation to that of his peers has been obtained.

Three steps are critical to the successful implementation of DBPM for social behaviors:

STEP 1 *Selecting the behavior(s) to observe.*

The behavior(s) to be observed must be stated in specific, objective, and measurable terms.

STEP 2 *Determine the reliability of the observations.*

Simultaneous observations should be made by two people to determine observer reliability.

STEP 3 *Collect the data over time.*

Observations on the behavior(s) of concern must be made over a period of days (usually, 5-7) to establish baseline performances for the referred student and his peers for comparison purposes.

Select the Behaviors to be Observed

STEP 1 What behaviors should be observed and recorded? Although in some approaches it is suggested that a decision on target behaviors depends on the individual case, we believe that a set of behaviors can be identified that fairly represent the "categories of concern" for most classroom teachers. These categories are "noise," "out of place," "physical contact," and "off task." The categories and their definitions follow:

Definitions of Categories

1. Noise: Any sounds created by the child which distract either another student or the teacher from the business at hand. The noise may be generated vocally (including "talk outs" or

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[6] The median is 36.

unintelligible sounds) or nonvocally ("tapping a pencil" or "snapping fingers").

2. Out of place: Any movement beyond the either explicitly or implicitly defined boundaries in which the child is allowed movement. If the child is seated at his desk, then movement of any sort out of the seat is "out of place."
3. Physical contact or destruction: Any contact with another person or another person's property which is unacceptable to that person. Kicking, hitting, pushing, tearing, breaking, taking, are categorized as physical contact or destruction.
4. Off task: Any movement off of a prescribed activity *which does not fall into one of the three previously defined categories*. "Looking around," "staring into space," "doodling," or any observable movement off of the task at hand is included.
5. Other: Although the behaviors defined above serve as a reasonable basis for most observations, individual cases may arise in which other behaviors should be recorded. Children may be identified who do not communicate or who donot interact. In such instances, either "self-initiated utterances" or "self-initiated contacts" may be added, defined, and recorded. Generally, however, the first four categories will encompass many of the discrete categories which might be considered, and the "other" category should only be used if absolutely necessary to clarify the "problem" identified by the teacher.

Determine Reliability of Observations

STEP 1

The definitions given will not, in themselves, produce consistency among recorders, and consistency among recorders is the criterion that determines the usefulness of a recording system. For that reason, it is recommended that whenever observations are considered necessary two or more people should observe and record the same behaviors at the same time on at least one occasion. The consistency of these observations can then be determined. Whenever two observers recording the same behavior at the same time disagree on the number of times the behavior occurred, some estimate of the disagreement should be obtained.

1. Two or more people should observe and record the same behaviors at the same time (at least once) to establish the reliability of the observation procedures. Be as unobtrusive as possible when making observations.

2. Check reliability:

$$\frac{\textit{Divide the smaller number of occurrences recorded by one observer by}}{\textit{The larger number of occurrences recorded by the other observer for the same behavior}} \times 100 = \%$$

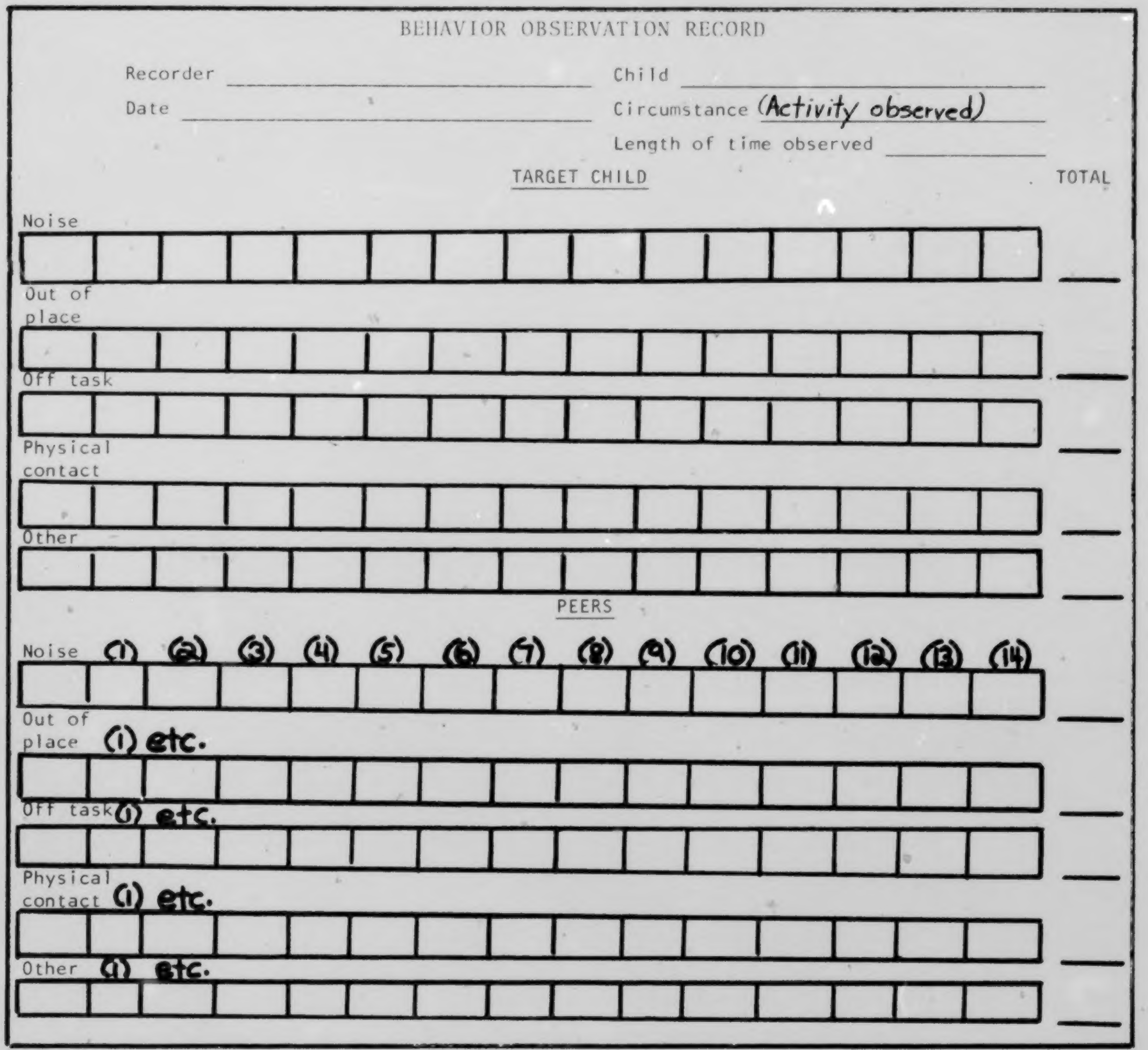
3. This percentage represents the degree of reliability between the two observations. When this percentage falls below 80%, the data are not reliable and another check should be made.

Collect Data over Time

STEP 1 a. Schedule convenient periods of 10-30 minutes each day for 5-7 days to observe the target pupil and his peers. If possible, observe the children for a total of 30 consecutive minutes for five days; if not, make observations for at least 10-20 minutes per day for 7 days.

b. Make up forms on which to record the observation data. The forms should include spaces to record the incidence of specific behaviors per minute for target pupil and peers, and beginning and ending times of observation (see Fig. V-10).

c. Obtain a stop watch to measure accurately the time intervals (minutes) of observation.



BEHAVIOR OBSERVATION RECORD

Recorder ____________________ Child ____________________

Date ____________________ Circumstance (Activity observed)

Length of time observed ____________

TARGET CHILD

TOTAL

Noise

Out of place

Off task

Physical contact

Other

PEERS

Noise (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14)

Out of place (1) etc.

Off task (1) etc.

Physical contact (1) etc.

Other (1) etc.

Fig. V-10. A form for recording observations of behavior in classroom. Each square represents one minute of observation.

d. Determine the random sampling methods you will use to select the peer group (e.g., going up and down rows; moving from one table to another clockwise; or alternating from left to right). Do not choose peers who sit near target child and do not alter the sampling pattern to include a peer who is exhibiting a behavior of interest.

e. In the classroom, be as unobtrusive as possible when entering, making observations, and leaving. However, do not deliberately ignore children who come up to you. A few brief visits before beginning the observations will help to acclimate the children to your presence in the classroom.

f. On the behavior observation record, enter a tally mark in the appropriate box for each occurrence of a behavior during a timed minute for the observed child. If the behavior is sustained for a full minute, only one mark is tallied for that minute, if the behavior does not occur, enter a (0).

g. Alternate observations between the target pupil and the peer group, focusing on a different peer each time (e.g., during 1st minute, observe target child; during 2nd minute, observe peer 1; during 3rd minute, observe target child; during 4th minute, observe peer 2, etc.).

STEP 2

a. At the end of each observation period, the number of times each behavior occurred for the target student is summed and divided by the length of the observation period. This is the target student's per minute rate of performance for these behaviors. Here is the formula:

$$\frac{\textit{Total no. of behaviors}}{\textit{Length of time of observation (in minutes)}} = \textit{Rate/min. for target pupil.}$$

b. At the end of each observation period, the number of times each behavior occurred for *all* the observed peers is also summed and divided by the observation time to obtain the per minute peer rate of performance for these behaviors (as though all the behavior was emitted by one person.) Here is the formula:

$$\frac{\textit{Total no. of behaviors}}{\textit{Length of time of observation (in minutes)}} = \textit{Rate/min. for peers.}$$

c. At the end of all the observation periods, the per minute rates for each behavior for each day of observation for the target student are ordered from high to low and the medians are selected.

d. The same procedure is followed to find the median for the peers' behaviors.

STEP 3

Plot the performance data on the graph for the target student and his peers.

a. Either equal-interval or equal-ratio graph paper is appropriate.

b. Make up a separate graph for each behavior.

c. The vertical axis represents performance per minute (total number of behaviors per minute). The horizontal axis represents successive calendar days and should be appropriately labeled.

d. Each day's per minute rate is plotted on the appropriate graph with a ○ for the target student and a △ for the peers.

e. The medians for the observations are written in a ⚲ for the target student and a ♁ for the peers.

f. On equal-ratio graph paper, the "record floor"[7] (least number of behaviors possible/minute) is computed on the basis of 1/min. and drawn on the graph, using dashes between each Tuesday and Thursday line.

$$\text{The "Record Floor"} = \frac{\text{1 (the least \# of behaviors possible)}}{\text{Time of observation}}$$

Minutes of Observation	Record Floor
10	.1
11	.090
12	.083
13	.077
14	.071
15	.066

If the least number of behaviors is "0" it is marked just below the record floor.

APPLICATION There follows an example of the application of these procedures to the observation of Ricky and his peers in four categories of behavior.

EXAMPLE G1: Determining Target Social Behaviors of Ricky and Peers

STEP 1 *Selecting the behaviors to be observed.*

During the initial referral interviews, Ricky's teacher made the following statements: "He is always in the middle of a fight." "He doesn't get along with the other students." "He makes a lot of noise." These statements prompted the SERT to select "noise," "physical contact," and "out of place" as behaviors to observe in the classroom. Ricky's poor academic performance also indicated the need to observe off-task behaviors.

STEP 2 *Determining observer agreement.*

The school psychologist made observations with the SERT on one day; 95% agreement was obtained between them.

STEP 3 *Sampling the performances.*

The SERT observed Ricky and his peers on five different days, at different times during the days for 20-minute periods.

During each 20-minute period, the SERT spent 10 minutes observing Ricky and 10 minutes observing his peers, alternating the minute-by-minute observations.

STEP 4 *Summarizing the data.*

Each day's totals were summarized for each behavior for both Ricky and all his peers. After the totals were ordered from high to low, the medians were selected for each.

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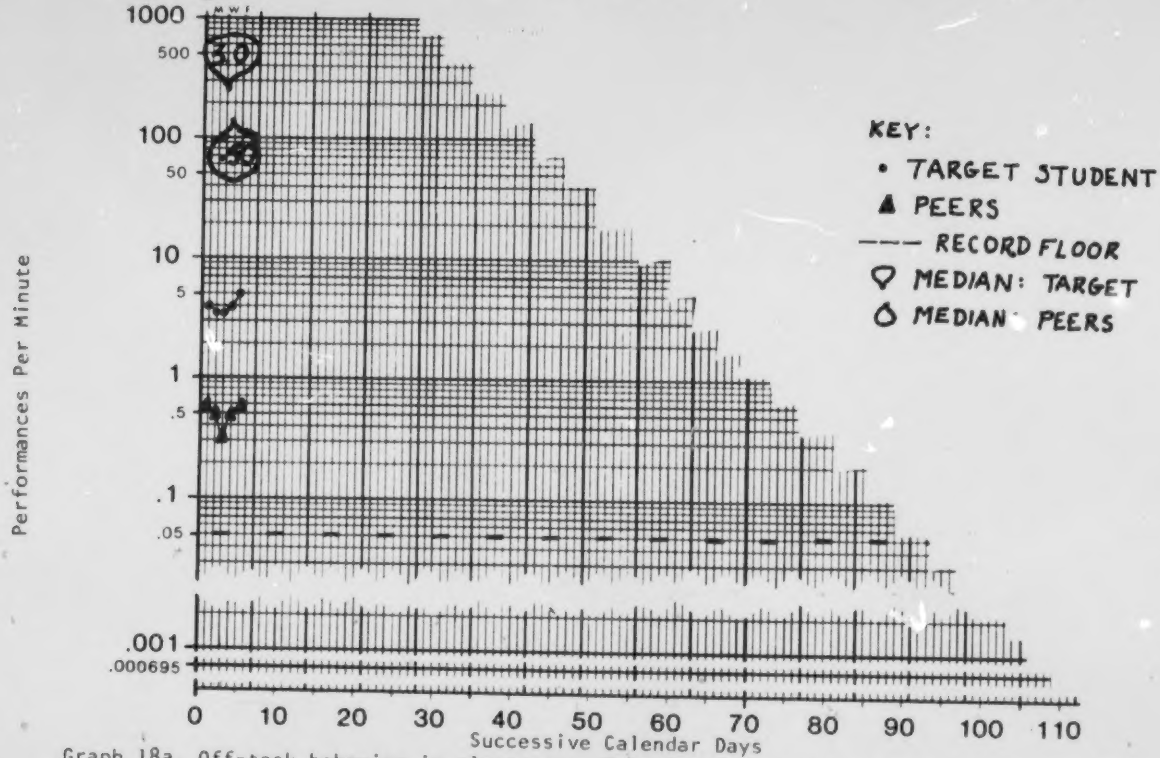
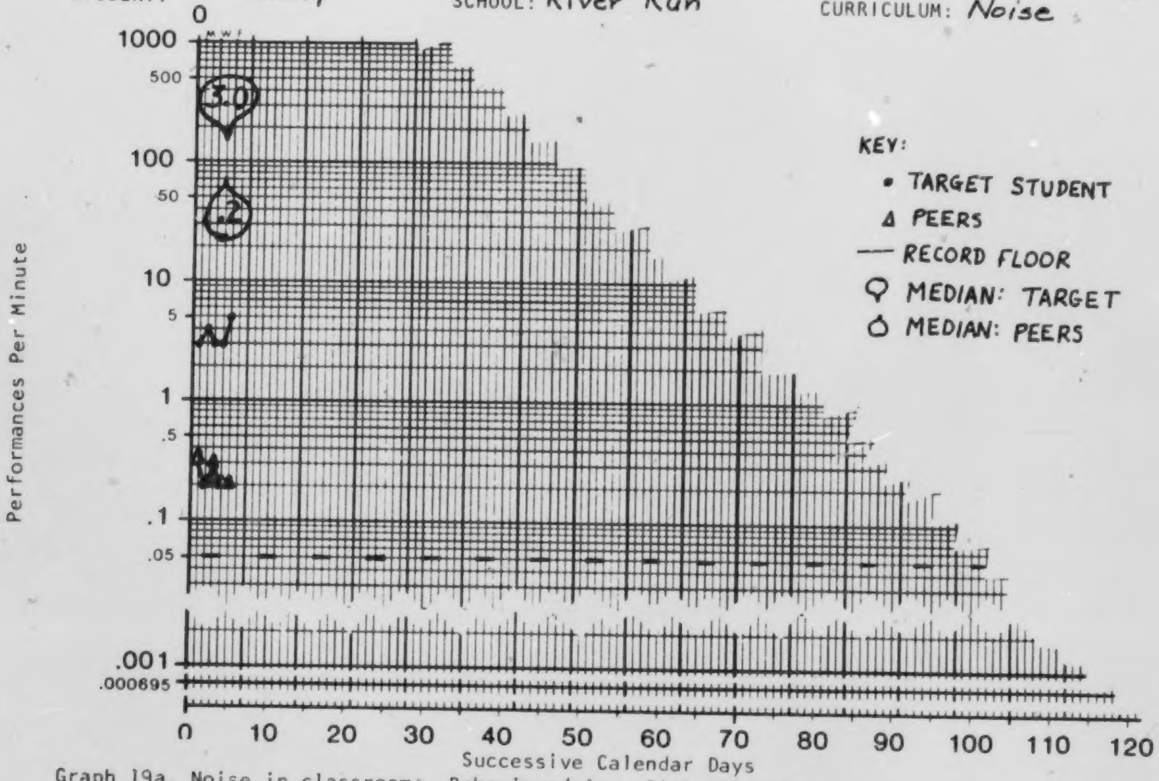
[7] See Pennypacker, Koenig, & Lindsley (1972) for discussion of concept.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Off Task



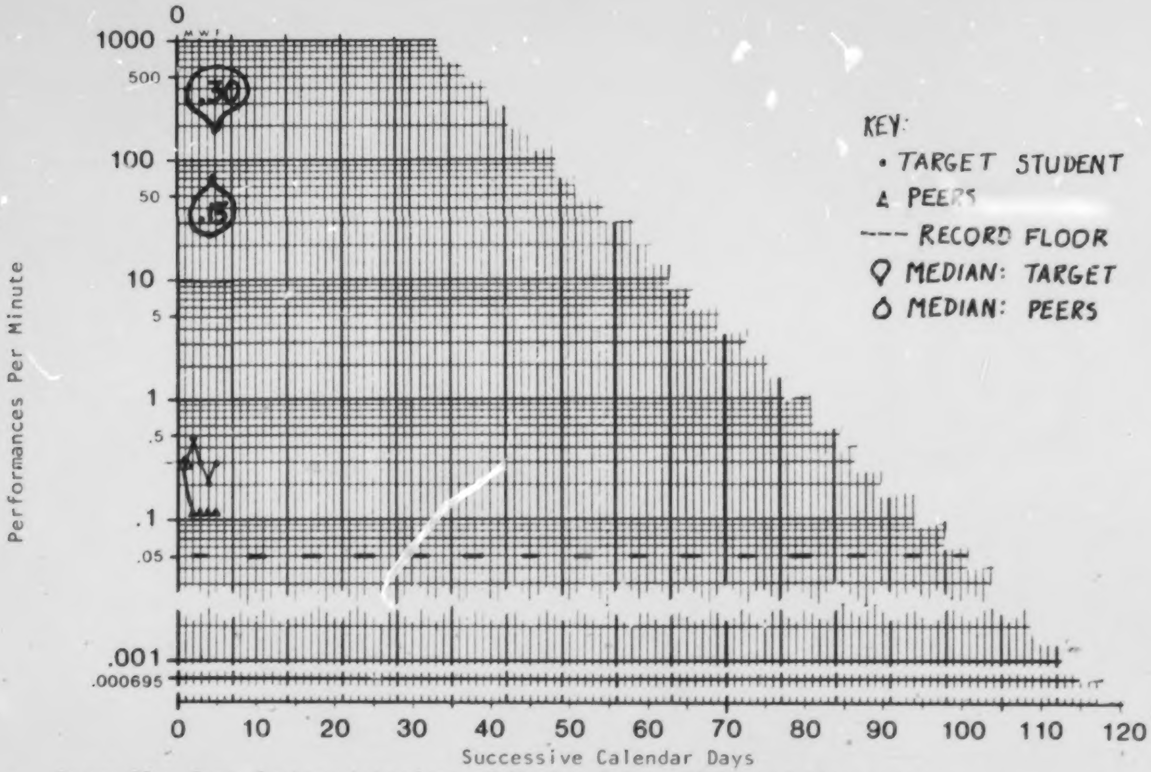
Graph 18a. Off-task behavior in classroom: Behaviors/min., Ricky and his peers.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Noise



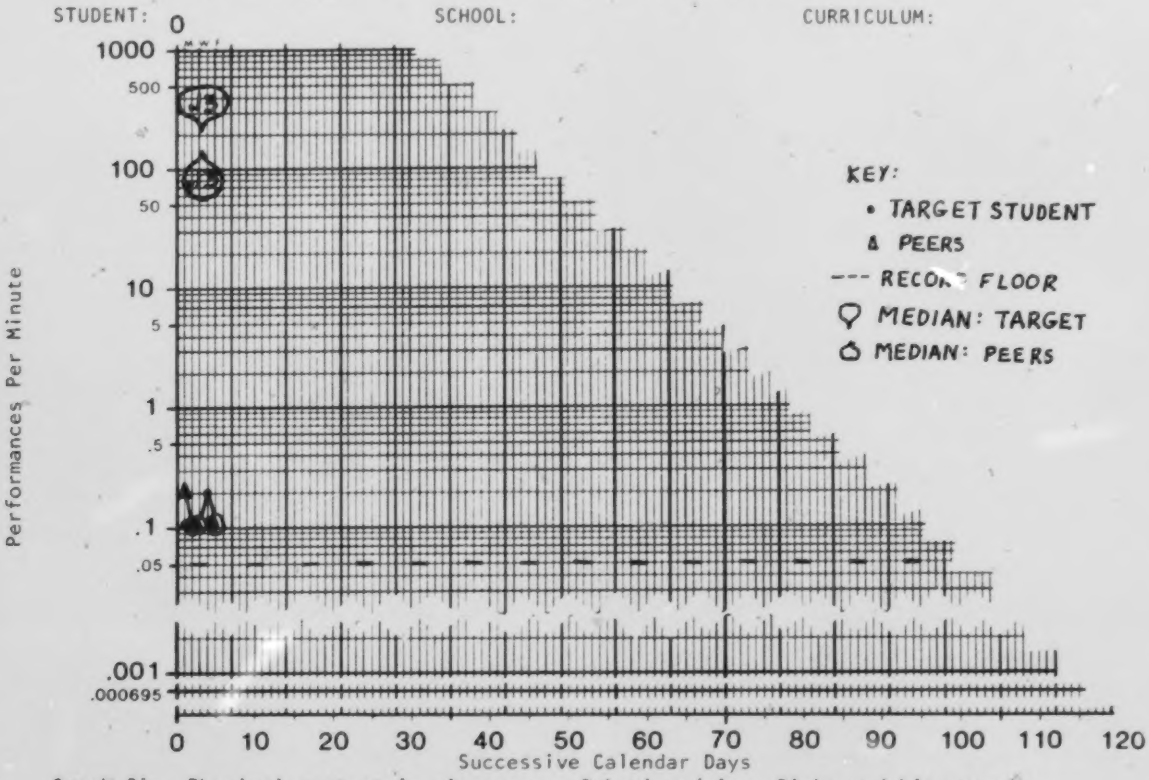
Graph 19a. Noise in classroom: Behaviors/min., Ricky and his peers.

STUDENT: SCHOOL: CURRICULUM:



Grapn 20a. Out-of-place behavior: Behaviors/min., Ricky and his peers.

STUDENT: SCHOOL: CURRICULUM:



Graph 21a. Physical contact in classroom: Behaviors/min., Ricky and his peers.

	OFF TASK		NOISE		OUT OF PLACE		PHYSICAL CONTACT	
	Ricky	Peers	Ricky	Peers	Ricky	Peers	Ricky	Peers
Day 1	3.0	.60	3.0	.30	.30	.40	.12	.20
2	2.8	.50	4.0	.20	.50	.13	.13	.13
3	2.8	.30	3.0	.30	.30	.13	.13	.13
4	3.0	.50	3.0	.20	.20	.13	.20	.10
5	4.0	.60	5.0	.20	.30	.13	.13	.13
MEDIAN	3.0	.50	3.0	.20	.30	.13	.13	.13

STEP 5 *Selecting the graphs and plotting performance data for Ricky and peers.*

a. The SERT elected to use equal-ratio paper to graph the performances of Ricky and his peers in each social behavior.

b. Four graphs were developed. Each was appropriately labeled; dates were placed on the horizontal axis.

c. Each day's rates were plotted on the appropriate graph with a ○ for Ricky and a △ for his peers.

d. The medians were placed in appropriate teardrops above the data points.

e. The record floor was drawn on each graph. Since each observation had been 20 minutes in length (10 minutes observing Ricky and 10 minutes, his peers), the record floor was computed as follows:

$$\frac{1 \text{ (least \# of behaviors possible)}}{10 \text{ (length of observation period)}} = .1$$

The data plotted by the SERT for each behavior are shown in Graphs 18a, 19a, 20a, and 21a.

6 Procedures to Compute Discrepancy Ratios

There are detailed in this section the procedures for computing three kinds of discrepancy ratios and using a Discrepancy Ratio Worksheet. The discrepancy ratios described are for (a) academic progress, (b) academic performance, and (c) social behavior. Procedures for using the Discrepancy Ratio Worksheet are given in 6d.

6a *Computing discrepancy ratios for progress.*

After actual and desired mastery levels have been determined in a subject for a referred student, the discrepancy ratio between the two levels is computed by the following procedures:

STEP 1 *Determine the amount of progress.*

The discrepancy ratio for progress in a subject is defined as the relative difference between *desired progress* (1 month progress per one month in school) and the target student's actual progress. The amount of progress desired is the curriculum equivalent in months of the number of months the student has been in school. The actual amount of progress is the target student's present mastery level expressed in terms of curriculum months.

STEP 2 *Compute the discrepancy ratio.*

To compute the ratio, divide the larger of the progress levels by the smaller. That is all there is to it!

$$\frac{\text{Larger progress level}}{\text{Smaller progress level}} = \text{Discrepancy ratio}$$

APPLICATION The formula for the discrepancy ratio for progress is applied to the data collected on desired and actual progress in the Read Series, phonics, and math sequences for Ricky (Examples H1, H2, H3).

EXAMPLE H1: Computing the Discrepancy Ratio for Ricky in the Read Series

STEP 1 *Determining amount of progress.*

The SERT reviewed Graph 12b and determined desired mastery level for beginning third grade to be completion of Book G or 18 months of progress, and Ricky's mastery level to be Page 60 in Book C or 4 months of progress.

STEP 2 *Computing the discrepancy ratio.*

$$\frac{\text{18 months of progress}}{\text{4 months of progress}} = 4.5X$$

Ricky is progressing at a rate which is 4.5X less than desired for average students of his age and grade. Stated differently, Ricky's peers are mastering 4.5 months of work for every month of work that Ricky masters!

EXAMPLE H2: Computing the Discrepancy Ratio for Ricky in the Phonics Sequence

STEP 1 *Determining amount of progress.*

The SERT reviewed Graph 13b and determined beginning third-grade mastery level to be completion of Category 24 or 18 months of progress, and Ricky's mastery level to be Category 17 or 9 months of progress.

STEP 2 *Computing the discrepancy ratio.*

$$\frac{\text{18 months of progress}}{\text{9 months of progress}} = 2.0X$$

Ricky is progressing at a rate which is 2.0X less than desired for average students of his age and grade. Alternatively, Ricky's peers are mastering 2.0 months of work in phonics for every month of work that Ricky masters.

EXAMPLE H3: Computing the Discrepancy Ratio for Ricky in the Math Sequence

STEP 1 *Determining amount of progress.*

Review Graph 14b and make your own determination of desired progress for average third-grade students and Ricky's actual progress in math. Check your answer below.[8]

STEP 2 *Computing the discrepancy ratio.*

Compute the discrepancy ratio by dividing the larger amount of progress by the smaller, then check your answer below.[9]

---

[8] *Desired mastery level* = 18 months (Category 22)
Actual mastery level = 5 months (Category 2)

[9] $\frac{\text{18 months}}{\text{5 months}} = 3.6X$ less than desired

⑥b *Procedures to compute discrepancy ratios for performance graphs.*

After actual (baseline) performance level for the target student and desired performance level for students of the same age/grade on the same tasks have been determined, the *discrepancy ratio* between the target student's actual performance and desired performance is computed by the following procedures:

STEP 1 *Determine desired and actual performance levels.*

See the procedures described in STEP 1 of (6a) and review the relevant graphs.

STEP 2 *Compute the discrepancy ratio.*

Divide the larger performance level by the smaller performance level.

$$\frac{\textit{Larger performance level}}{\textit{Smaller performance level}} = \textit{Discrepancy ratio}$$

APPLICATION In the following three examples, the procedures are applied to computing Ricky's discrepancy ratios for performances on math facts, spelling, and handwriting.

EXAMPLE I: Computing the discrepancy ratio for Ricky in math facts, spelling, and handwriting

STEP 1 *Determining desired and actual performance levels.*

After reviewing Graphs 15a, 16a, and 17a, the SERT made the following determinations:

Math facts: Ricky's actual performance level in writing answers to multiplication facts is 10 facts/min. The median rate of performance for average students in Ricky's grade is 20 facts/min.

Spelling: The desired level for spelling letters correctly in sequence is 30 letters/min.; Ricky's actual performance is 15 letters/min.

Handwriting: Can you determine the desired and actual performance levels for Ricky's peers and Ricky in handwriting? Check your answer below.[10]

STEP 2 *Computing the discrepancy ratios.*

The SERT computed the ratios to be as follows:

Math facts: $\frac{\textit{20 (desired rate of performance)}}{\textit{10 (actual rate of performance}} = 2.0X$

Ricky is writing answers to math facts at a rate which is 2X less than that for average students of his age and grade.

Spelling: $\frac{30}{15} = 2.0X$

Ricky is writing letters correctly in sequence in spelling at a rate which is 2.0X less than average students of his age and grade.

Handwriting: Compute the discrepancy ratio by dividing the larger performance level by the smaller performance level. Check your answer below.[11]

---

[10] The desired level for handwriting is 40 letters/min.; Ricky's performance is 36 letters/min.

[11] Ricky is writing letters correctly at a rate which is $\frac{(40)}{(36)}$ = 1.1X less than the rate for average students of his age and grade.

(6c) *Procedures to compute discrepancy ratio for social behavior*

A summary of the data from Graphs 18a-21a is given in Table 8.

Table V-1

Median or Middle Frequencies of Displays of Four Social Behaviors: Discrepancies Between Ricky and Ricky's Peers

	Noise	Out of Place	Physical Contact	Off Task
Ricky	3.0	.30	.13	3.0
Peers	.20	.13	.13	.50
Discrepancy	15.0X	2.3X	1.0X	6.0X

The discrepancy ratios have been computed in exactly the same way as those for other performance graphs (i.e., the larger number divided by the smaller).

The summary chart shows that during the observation periods, Ricky was 15X "noisier," 2.3X more "out of place," no different in "physical contact," and 6.0X more "off task." These ratios were obtained for each category of behavior simply by dividing the larger number by the smaller.[12]

(6d) *Procedures for using discrepancy ratio worksheet*

In DBPM, discrepancy data are central to the determination of the referred student's problem, establishment of the student's eligibility for special education services, and, subsequently, evaluation of the effect of different program changes on reducing the discrepancy. To meet these purposes, the worksheet is organized to show all the discrepancy data in one place with clarity and ease.

The worksheet contains spaces for recording the discrepancy ratios for 10 behaviors at the initial assessment and for each program change. Space is also provided to show the changes in the discrepancy ratios over initial assessment after every 3 program changes.

One box on the worksheet is labeled for each behavior assessed, and the discrepancy ratio determined at the initial assessment is recorded in the space provided. The procedures for filling in the subsequent spaces are discussed in the relevant chapters.

During the initial assessment phase, the data on the worksheet are used by the SERT to write the rationale for the importance of the referred student's problem(s) and to organize the presentation at the eligibility staffing.

EXAMPLE

The discrepancy data for all of Ricky's behaviors assessed by the SERT are given on a Discrepancy Ratio Worksheet (see p. 112). The data are then summarized on Case Report Summary Two.

For reasons of space in the following worksheet two ratios have been omitted:

	Out of Place	Physical Contact
Desired Level	.30/min.	.13/min.
Actual Level	.13/min.	.13/min.
Discrepancy	2.3X	1.0X

---

[12] Percentages also can be computed from the scores; e.g., "noise": (3.0 ÷ .20) - 1 = 14 = 1400%; "out of place": (.30 ÷ .13) - 1 = 1.30 or 130%.

DISCREPANCY RATIO WORKSHEET

Student Ricky School River Run Teacher Ms. B.

BEHAVIOR 9/25

Reading	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.												
ACTUAL LEVEL	9 mos.												
DISCREPANCY	4.5x less												

BEHAVIOR 9/25

Math Seq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.												
ACTUAL LEVEL	5 mos.												
DISCREPANCY	3.7x less												

BEHAVIOR 9/25

Math Facts	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	20/min.												
ACTUAL LEVEL	10/min.												
DISCREPANCY	2.0x less												

BEHAVIOR 9/25

Phonics Seq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.												
ACTUAL LEVEL	9 mos.												
DISCREPANCY	2.0x less												

BEHAVIOR 9/25

Spelling	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	30/min.												
ACTUAL LEVEL	15/min.												
DISCREPANCY	2.0x less												

BEHAVIOR 9/25

Handwriting	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	40/min.												
ACTUAL LEVEL	36/min.												
DISCREPANCY	1.1 x less												

BEHAVIOR 9/25

Noise	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	.20/min.												
ACTUAL LEVEL	3.0/min.												
DISCREPANCY	15 x more												

BEHAVIOR 9/25

Off Task	Init. Assess.	Change	Change	Change
DESIRED LEVEL	.50/min.			
ACTUAL LEVEL	3.0/min.			
DISCREPANCY	6.0X more			

Note: Two behaviors--Physical Contact and Out of Place--have been omitted because of lack of space.

CASE REPORT SUMMARY TWO[*] ⑧

Ricky J.	3	9	Ms. B.
Student	Grade	Age	Teacher

2. Is there a discrepancy between desired and actual performances?

What are the discrepancy ratios for high priority behaviors?
What data are available on past history of progress/performance?

List the priority behaviors and discrepancies here.

BEHAVIOR	BASAL READING	MATH SEQUENCE	PHONICS SEQUENCE	MATH FACTS	HAND-WRITING	SPELLING
DISCREPANCY	4.5X LESS	3.7X LESS	2.0X LESS	2.0X LESS	1.1X LESS	2.0X LESS

BEHAVIOR	NOISE	OUT OF PLACE	PHYSICAL CONTACT	OFF TASK		
DISCREPANCY	15.0X MORE	2.3X MORE	1.0X	6.0X MORE		

Summarize appropriate data from cumulative file here.

Ricky was tutored in reading and math in grade two. There is no history of any physical handicap.

---

[*] Data collected on high-priority behaviors and past history are summarized on this form.

References

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Pennypacker, H.S., Koenig, C.H., & Lindsley, O.R. *Handbook of the Standard Behavior Chart*, Kansas City: Precision Media, 1972.

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Starlin, C., & Starlin, A. *Guides for continuous decision making*. Bemidji, Minn.: Unique Curriculums Unlimited, 1974.

Reference Notes

1. Gallistel, B. & Ellis, E. K. Reading and spelling categories. Unpublished manuscript. University of Minnesota, 1970.
2. Dolch, E. W. *Dolch list of 220 most commonly used words*. Champaign, Ill.: Garrard Publishing Co. (1607 North Market Street, 61820). (no date)

Chapter VI

PROBLEM SELECTION: EVALUATION

Decision Area:
Problem Selection

Program Phase:
Initial Assessment

Overview

Contents

Overview
Matrix questions
Implementation

When data on the magnitude of the discrepancies have been collected, the next step is to evaluate their importance and establish the student's eligibility for service. This chapter focuses on the questions, materials, and activities that lead to the evaluation of the discrepancies in the referred student's progress/performance. Two approaches to determining eligibility for service are discussed: (a) decision matrix and (b) collaborative; DBPM works with both. It is for the reader to decide which is the better model for a particular school or district.

The important point is that discrepancy ratios are vital to the decision-making process in DBPM, whatever the approach to determining service eligibility or the other data that may be required or desired. During this phase of problem selection, therefore, the SERT (a) reviews the discrepancy ratio information on the worksheet, (b) reviews the priorities which have been identified, and (c) evaluates the interview data. These three items of information are used by the SERT to write a rationale for the importance of the problem, and this rationale becomes the basis for evaluating the student's eligibility for service at the staffing.

PROCESS: Evaluation

DECISION AREA: Problem Selection
PROGRAM PHASE: Initial Assessment

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
3. Is the student eligible for service?	Guidelines for making the eligibility decision. ①	
Have important discrepancies been identified?	Procedures to review and evaluate data. ②	Review discrepancy data and select discrepancies which meet criteria. ②
Can a rationale be established for the importance of the problem?		Write a rationale for the importance of the problem on Case Report Summary Three. ②
Does student meet eligibility requirements?		Convene staffing to make eligibility decision. ②
		Summarize decision on Case Report Summary Four. ②

Making the Eligibility Decision ①

To this point, the assessment activities of the resource teacher have been directed toward numerically describing the size of the difference, if any, between the actual academic and social behaviors of the referred student and the behavior desired from him by the significant others of his society. The definition of "exceptionality" implied by the assessment procedures used to yield these numerical descriptions is a combination of two perspectives: (a) the ecological (Rhoades, 1967) which, in its simplest terms, maintains that a problem exists when the relationship between the referred student and a significant other is disturbed; and (b) the deviance, which maintains that a problem exists whenever the behavior of the referred student deviates significantly from the behavior of his peers (i.e., from normative behavior).

The ecological perspective is admirable because it tends to eliminate "person blame" from definitions of "the problem" by focusing instead on a disturbed relationship between the individual and others in his culture. The ecological perspective implies that as much attention must be given to the requirements (desires) of the culture as to the behavior of the referred student. The ecological approach says, in fact, that it is not possible to understand the problem by simply observing (assessing) the referred student because the problem does not exist within the individual.

In DBPM, the assumption is that the problem for the referred student exists not in him but between his behavior and that desired from him by others. This assumption is consistent with the ecological perspective and it is the reason why the resource teacher spends much time in interviewing and establishing the priorities of parents, teachers, and other persons who are concerned with the student's development.

The deviance perspective influences assessment during the problem selection phase of DBPM by implying that exceptionality means that the behavioral development of the individual is significantly different from his peers. A deviance approach, then, directs us to determine the magnitude of difference between the behavior of the individual and that of his peers. SERTs follow this approach when they use direct observation and daily measurement of not only the referred student's behavior but, also, a sample of his peers' behavior on the same tasks. The approach is useful because it provides all the people concerned with the child's development with an empirical description of the behavioral differences that led to referral.

A summary of the influence of these two perspectives on DBPM has been presented at this point because an understanding of the assumptions upon which each is based is necessary for making the *eligibility decision*--the decision that the academic and social behaviors of a child are, in some sense, exceptional enough to warrant special education intervention.

Before considering the recommended procedures for making the eligibility decision in a DBPM, however, we need to point out that in some instances the procedures for determining eligibility are not in the hands of the SERT. Procedures may have been established at another level (e.g., state or local education agency) that involves other professionals to the exclusion of the SERT. Our view is that such instances are not only unfortunate but a condition which the SERT should work to change. The passage of P.L. 94-142 should help. The following outlined procedures may provide a model toward which the excluded resource teacher may work in such instances:

Approach #1: A Decision Matrix

Making the eligibility decision in a data-based approach involves establishing a decision framework that gives weight to both the ecological and the deviance definitions of exceptionality.

For convenience, we can illustrate the dimensions of concern implied by the two perspectives, the "importance/value" dimension (ecological) and the "difference/discrepancy" dimension (deviance) and combine them in a matrix:

Difference/Discrepancy
of Behavior

Importance/Value of Behavior

		Large	Medium	Small
High				
Moderate				
Low				

To use such a matrix for decision making requires that prior classification criteria be established by those persons who are responsible for allocating special education resources.[1] An example is given below:

Behaviors Typically Present	Importance/Value
1. Year 0-1	10
2. Years 1-3	9
3. Years 3-5	8
4. Year 5	7
5. Years 6-8	5
6. Years 9-11	3
7. Years 12-14	2
8. Years 15-18	1

The particular value ordering in the example indicates that an inverse relation exists between the importance assigned to the particular behavior and the age at which it is usually manifested. In practice, this value ordering would mean that in decisions to allocate special education resources, more weight would be given to the development of preschool behaviors than school-age behaviors, or that more weight would be given to the development of behaviors associated with middle childhood than adolescence.

To complete the matrix presented above, levels along the difference/discrepancy dimension must also be quantified and weights assigned. As has been noted earlier, discrepancies in performance or progress can be measured and summarized by using a discrepancy ratio such as 1X (no discrepancy), 2X (desired performance or progress twice as great as actual performance or progress), 3X (desired performance three times greater than actual), and so on.

Given such a formulation, all that remains is to combine the importance/value weights with the discrepancy ratios; the combination yields an estimate of the magnitude of the referred child's exceptionality or problem.

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[1] At the present time it seems reasonable to include representation from parents, general educators, and special educators in the "responsible persons" category.

An illustration follows of how such a system can be used:

STUDENT: Ricky AGE: 9

Behavior Measured	Importance/ Value (Established by priority rankings)	X	Discrepancy (Established by measurement data)	=	Weighted Discrepancy
Reading	15	X	4.5X	=	67.5
Math	10	X	3.7X	=	37.0
Noise	5	X	15.0X	=	75.0
					179.5

$$\text{Weighted discrepancy} = \frac{179.5}{30.0} = \frac{\text{(Total Weighted Discrepancy)}}{\text{(Total Importance Value)}} = 6.0X$$

Although only three behaviors are used in the decision-matrix illustration, the weighted discrepancy is 6.0X or 4.0 points higher than the cut-off of 2.0 established in River Run School. In the actual decision-making process, of course, all 10 of Ricky's assessed behaviors would have been included in the matrix.

For each behavior, the following criteria must be met:

1. Each behavior (or set of behaviors) relevant to the initial referral be measured.
2. Each behavior measured be assigned an importance/value weight based on some a priori system (i.e., priority rankings).
3. The discrepancy between the target behavior and desired behavior computed.
4. The importance/value weight assigned to the target behavior be combined arithmetically (as in the illustration, by multiplication) with the computed discrepancy.
5. The discrepancy between the total obtained for the referred child and his "normal" peers be computed.

At this time, the decision on whether the child is exceptional enough to be eligible for service requires a *policy decision* which is based on the understanding of state special education laws and regulations and school system policy. To complete the decision matrix approach to determining eligibility for service, a selection/rejection point should be determined for your program, and the determination *should be made in advance*.

Although an inadequate amount of research has been conducted to establish a firm basis for any particular selection/rejection point, we believe most special educators would agree that children should be eligible for special education service when they are at least *2X discrepant* from their peers. When discrepancies less than 2X are obtained, more disagreement will occur over whether the child is exceptional enough to warrant special education service. When discrepancies greater than 2X are obtained, agreement is greater that the child is eligible for service.

Approach #2: The Collaborative Model

Many people both in and out of education are skeptical of the possibility that decisions like the determination of eligibility can be made quantitatively through an approach like the decision matrix. They believe that important factors may be overlooked thereby and may escape the measurement net. Too, many people believe that the decision process is more complex, that it requires the special abilities (and feelings) which caring humans can bring to bear when they discuss the evidence and testimonials presented by persons with a vested interest in a particular case. For those people who are reluctant to leave decisions to a decision matrix approach, the most straightforward and simplest approach is the collaborative model.

The collaborative model is essentially simple. Upon the completion of initial assessment, those persons who should be represented in the decision process (i.e., parents, child, general and special educators, principal, social worker, counselor, psychologist, nurse-physician) meet to consider the information which has been collected. Examples of such information are presented in the clear example of the case report for Ricky.

After this information is shared, either verbal concensus is obtained on eligibility or a vote is taken to determine the majority opinion. (Current efforts to protect the child under due process of law suggest that a formal vote be taken and recorded.)

Improving the precision of the collaborative approach usually requires that a system be developed for formally organizing each type of information (i.e., medical, educational, and psychological information, and personal opinion), which includes specification of who is responsible for organizing and presenting each type of information. In addition, fairly formal procedures for conducting collaborative meetings should be established to prevent the irrelevant discussion of "horror stories" about a child's behavior, which often dominates such discussions. We recommend that the SERT chair such meetings, be responsible for establishing a rationale for the importance of the problem, summarize the outcomes, and carefully record and distribute the summaries to all concerned parties.

A combination of some form of both the decision matrix approach and the collaborative approach is possible, of course, and, at the present time, desirable. To use a combination of approaches increases the data base for making the decision to allocate or not the precious and limited resource of special education service to a specific child.

② Procedures to Determine Eligibility for Special Education Service, Using the Collaborative Model

STEP 1 *Review the collected data.*

Review the discrepancy data worksheet and the interview and priority data.

STEP 2 *Write a rationale for the importance of the problem.*

A short paragraph can indicate why the student should be considered for service. Be as concise and specific as possible.

STEP 3 *Arrange for a staffing.*

Convene the student support team to consider the information gathered in the initial assessment of the student's academic and social behaviors, priority rankings, and interviews.

STEP 4 *Present the data.*

Present the data collected by the SERT and others. For the SERT, these data include the following:

1. Discrepancy Ratio Worksheet
2. Priority rankings.
3. Rationale for the importance of the problem.
4. Evidence that the individual's rights have been protected (e.g., written consent of parent for the assessment).

STEP 5 *Make the eligibility decision.*

Make the eligibility decision on the basis of the team's evaluation of the importance of the problem, other federal, state, or local guidelines, and previously established criteria (i.e., discrepancy ratios greater than 2.0X).

STEP 6 *Summarize results.*

Record and summarize the decision made and communicate with parents (if not present) and other interested persons and agencies.

EXAMPLE

STEP 1 *Reviewing the collected data.*

The data summarized in the Case Report Forms (#1, Ch. IV; #2, Ch. V) and on the discrepancy worksheet were reviewed by the SERT. The discrepancy ratios ranged from 2.0X less to 15.0X more for all the behaviors assessed except for handwriting and physical contact.

Academic Behaviors	
Phonics Sequence	2.0X less
Spelling	2.0X less
Math Sequence	3.7X less
Math Facts	2.0X less
Reading	4.5X less

Social Behaviors	
Out of Place	2.3X more
Off Task	6.0X more
Noise	15.0X more

A review of the interview and priority data confirmed reading and math as the highest priority academic behaviors and noise as as one of the highest priorities in the area of social behaviors. Physical contact, which concerned the teacher, did not emerge after observation as a discrepant behavior (1.0X). Ricky was observed to engage in the same amount of physical contact as his peers. The SERT made a note to discuss with the teacher whether fights were a problem in settings other than those in which the observations were made. Further observations could be arranged if they were indicated.

STEP 2 *Writing a rationale for the importance of the problem.*

On the basis of the review, the SERT wrote a rationale for the importance of providing Ricky (and his teacher) with special education support service. This rationale was written in paragraph form directly on Case Report Summary Three to use at the eligibility staffing.

Before you read the rationale written by the SERT, why not try to write one yourself? Right now you have as much information as the SERT except that your experience with the activities was second-hand.

Is there justification for providing service to Ricky?

What do you see as the most persuasive data to support the position that Ricky should receive service?

If Ricky were a student in your school, would he be eligible for service?

What other data would you have been expected to collect in your school?

Do you think additional data are needed before a decision on Ricky is made?

Perhaps you can share the information on Ricky with other resource teachers in your school or district and elicit their reactions to the questions.

CASE REPORT SUMMARY THREE ②

The rationale for the importance of the problem is written here.

Ricky J.	3	9	Ms. B.
Student	Grade	Age	Teacher

3. Is the student eligible for service?
Have important discrepancies been identified?
Can a rationale be established for the importance of the problem?

Write a rationale for the importance of the problem here.

Ricky is a 3rd grade student who is presently achieving mastery of basic skill subjects at a much slower rate than his classmates. His progress is 4.5X slower than peers in the Read Series; 3.7X slower in progress in the math sequence; 2.0X slower in progress through the phonics sequence. Performances in spelling and computing math facts are also highly discrepant from peers. On four categories of social behavior Ricky's performance was 15X noisier; 6X more off task; and 23X more out of place. Disturbing physical contact was the same as peers.

The discrepancies suggest that without intervention, by completion of Grade 6 Ricky will have achieved approximately mid-second grade mastery level. These projections underline the urgent need for support service for Ricky's program.

Date Completed 9/26/75

By SERT

STEP 3 *Arranging the staffing.*

The staffing to discuss Ricky's eligibility was arranged at the time of the initial referral (see Ch. IV).

STEP 4 *Presenting the data.*

The SERT duplicated copies of the Discrepancy Ratio Worksheet for distribution at the staffing. Case Report Summaries 1, 2, and 3 were read and discussed.

STEP 5 *Making the eligibility decision.*

The faculty at River Run School had previously established a discrepancy ratio greater than 2.0X in one or more academic or social behaviors as the criterion for eligibility for special education service. Should the service facilities be limited, students would be rank ordered on the basis of number of discrepancies; those with the greatest number would be given priority. (An alternative choice could be made on the basis of the decision matrix.)

STEP 6 *Summarizing the results.*

The results of the staffing are summarized in Case Report Summary Four.

Reference

Rhoades, W.C. The disturbing child: A problem of ecological management. *Exceptional Children*, 1967, *33*, 449-455.

CASE REPORT SUMMARY FOUR ②

The eligibility decision is summarized here.

Ricky J.	3	9	Ms. B.
Student	Grade	Age	Teacher

3. Is the student eligible for service? (cont.)
Does the student meet established eligibility requirements?

Summarize the results of the staffing here.

Discrepancy data presented by
the SERT were of a greater than
2.0X magnitude in all areas
assessed except handwriting and
out of place. There was general
agreement that Ricky more than met
the eligibility requirements established
with so many areas of great discrepancy.
Ricky was accepted, therefore, for
special education support
service at River Run School.

Date Completed 9/27/75

By SERT

Participants
SERT
Ms. B.
Mr. H. (Principal)
Social Worker —
Ms. T.

PART III

Developing DBPM Skills in Program Selection

Introduction

Part III describes in detail the specific procedures that are used in the program selection phase of DBPM. It consists of one chapter and comprises the evaluation, measurement, and communication and collaboration procedures. Like the chapters in Part II, Chapter VII starts with an overview and then presents the detailed set of questions, materials, and activities that amplify the matrix cell from which the questions were taken.

This phase of DBPM focuses on the selection of program plans for the referred student who has been identified as eligible for special education service. The term "selection" is used deliberately to emphasize two points:

1. More than one alternative plan to meet the needs (solve the problems) of a target child, who has been identified through intake assessment, can and should be considered by all persons involved in the referral.
2. Changes in a student's educational program should be made on the basis of explicit rather than implicit decisions.

The first point, that alternatives should be planned and considered, is based on the assumption that the chances of solving a problem successfully are increased if multiple rather than one possible solution are available. Little needs to be said about such an assumption save that it is well supported in the psychological literature on problem solving. No problem ever has just a "single solution"; a number of alternative solutions can be devised for almost any problem and each offers some possibility of success.

The creation of alternative solutions is an important characteristic of DBPM. It emphasizes an experimental approach to educational problem solving. In the intended sense of the word, "experimentation" requires the systematic measurement of the effects of successive different changes which are systematically introduced into a process. The experimental approach is especially applicable to solving human problems because the uniqueness of each individual makes it impossible to predict the specific effects of any single change, or set of changes, on the individual. If alternative changes are devised and considered prior to program selection, then these alternatives can be tested subsequently to find the program that is most successful. The attitude engendered by this approach prevents the professional staff from trying to predict the future on hope alone. DBPM establishes at the outset that no one knows exactly what program is best for a pupil until different programs have been tried.

The second point emphasizes that once eligibility has been determined, program changes do not just "happen." Rather, they proceed from formal or informal plans which have been developed and acted upon by people who are in a position of influence relative to a student or problem. Making the process of selecting programs explicit has several good effects.

1. Program accountability is increased by making public who is responsible for the program decision, how those decisions are made, who is doing what to whom, and when program changes will be initiated.
2. Opportunities for making program decisions collaboratively rather than unilaterally are increased. With the growing recognition that all children have a place in the normal regular school environment, mechanisms must be created for developing and maintaining a sense of shared responsibility for the programs that are available there for the children. Collaborative decisions in "program selection" make public

the fact that a group of professionals rather than one resource teacher alone has a stake in the success or failure of the program.

3. Explicit program-selection decisions, made collaboratively, increase the opportunity for due process protections and, therefore, countercontrol. We have taken a long time to learn that even the best-intentioned persons sometimes develop programs that work to the detriment of the very students for whom the programs were designed (Hobbs, 1975). From our point of view, the primary cause of such errors is the omission of countercontrol procedures in educational programing. Until recently, all power for program decisions rested in the hands of educators, a condition that leads to abuse in the education of children in the same way that narrow centralization of power has led to abuse in the treatment of state hospital patients and prison inmates. Mechanisms for counter-influence in such institutions have been developed only recently. A public decision-making process that includes fair and just representation of all involved parties insures opportunities for countercontrol as well as control.

Educational programing for exceptional students must include protections during each phase of program development. The SERT must be sensitive to the issues related to due process protections mandated in P.L. 93-380[1] and P.L. 94-142. The SERT must work continuously to develop a program selection mechanism that includes the necessary protections for the right of parents or guardians to be involved in the decision-making process. At the University of Minnesota, the instrument that is used most often by our trainees is the student-parent-school staff contract (page 126). In this contract, each participant is publicly identified by name in writing (and, usually, by signature) as responsible for carrying out specific aspects of a program. In our experience, such a public commitment significantly increases the likelihood that a responsibility will be met and the selected program will, in fact, become operational. In addition, a program plan review procedure is included in this program selection phase to insure mutual commitment to common goals. These activities are described more fully in the following chapters on evaluation, measurement, and communication and collaboration.

The forms and materials for data gathering are included where necessary. Once again, summary data on Ricky are presented. The specific steps taken by the SERT in program selection are as follows:

STEP 1 Select specific discrepancies to be modified during first intervention.

STEP 2 Write long-range, weekly, and/or daily objectives for each discrepancy.

STEP 3 Specify two program changes for each objective.

STEP 4 Specify two alternative administrative arrangements for the program.

Some questions to consider as you work your way through the chapter are as follows:

1. Would you have selected the same set of behaviors for program modification? If not, which would you have selected and why?
2. Several alternative administrative arrangements are proposed by the SERT to implement the program plan. Would these plans be possible to implement

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[1] P.L. 93-380, Education Amendments of 1974.

AGREEMENT: CHRIS T./SCHOOL STAFF/PARENTS

Concerning the following behaviors:

1. On-task effort: Work at assigned tasks.
2. Social-Verbal behaviors: On time to class
   Necessary work materials
   Refrains from disruptive interaction

Chris agrees to:
1. Cut down his noise and talking out-of-place behavior to a satisfactory level as determined by classroom teachers.
2. Make an effort to complete assignments.
3. Carry a daily point sheet to teachers and leave it with Mr. M. (SERT) (Room 311) at the end of the day.

Teachers agree to:
1. Fill out the daily point sheet.

Mr. M. agrees to:
1. Monitor the program and communicate the results to teachers and parents.
2. Monitor Chris's free time--3rd period on Fridays.

Mr. and Mrs. T. (Parents) agree to:
1. Arrange for Chris to go with his friends on a four-day camping trip (if earned).
2. Take Chris horseback riding with his friends (if earned).

POINT SYSTEM
1. 45 points per week earns 30 minutes of free time.
2. 50 points per week earns one period of free time (3rd period Friday).
3. 180 points by May 16 (4 weeks) = camping trip.
4. 300 points by June 6 (7 weeks) = horseback-riding opportunity.

Free time may include any of the following or other activities agreed upon by Chris and Mr. M.:

Use the race car set in Room 311
Early dismissal
Time in Ms. B.'s EESA Reading Room
Game with a friend
Using AV machines in media center

Hall behavior
1. If Chris is placed on detention for inappropriate hall behavior he will lose the earned free time for that week.
2. If Chris is placed on detention 3 times he will lose the opportunity to go on the camping trip.

We agree that the contract is fair and clear and will carry out what is required of us:

Name	Date	Name	Date
/s/ Chris T.	4/18/74	/s/ David D. (Teacher)	4/19/74
/s/ Jane T. (Mother)	4/18/74	/s/ Wayne M. (SERT)	4/18/74
/s/ Arnold T. (Father)	4/18/74		

Fig. Part III-1. A contract agreement between a student/school staff/parents.

in your school? If not, what are the forces acting for and against the development of such arrangements in your school?

3. Program objectives are written in terms of "pages to be completed," "increases in performance/minute," and the like. What are some alternative ways of writing program objectives for the same behaviors?
4. What are the major differences between DBPM and other approaches you may have used before in program planning?

Reference

Hobbs, N. *The futures of children.* San Francisco: Jossey-Bass, 1975.

Chapter VII

PROGRAM SELECTION: EVALUATION, MEASUREMENT, AND COMMUNICATION AND COLLABORATION.

Decision Area:
Program Selection

Program Phase:
Program Planning

Contents
Evaluation
Measurement
Communication and Collaboration

Overview: Evaluation

Now that the referred student has been identified as eligible for special service, the time has come to select a program for him. During the first phase of program selection the SERT carries out four activities:

1. Select the first set of behaviors to be modified.
2. Generate long-and short-term objectives for each targeted behavior on the basis of the estimate of progress/performance that is needed to substantially reduce the pupil's discrepancies within a specified time period.
3. Select at least two program changes for each targeted behavior.
4. Generate two alternative administrative arrangements for implementing the program.

PROCESS: Evaluation

DECISION AREA: Program Selection
PROGRAM PHASE: Program Planning

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
5. What program plans are proposed?		
For which identified discrepancies will programs be developed at this time?	Procedures to select discrepancies to be modified. ①	Select discrepancies for which a program will be developed. ①
What program objectives are proposed for these behaviors? What progress/performance is estimated? How long an intervention is planned?	Procedures to write objectives. ②	Compute progress/performance estimates; select intervention period; write long- and short-term objectives for each discrepancy. ②
What program changes are proposed?	Guidelines for specifying program changes. ③	Select at least two program changes for each objective. ③
		Complete Case Report Summaries Five & Six.
What resources are available to implement the plan?	Suggested alternative administrative arrangements. ④	Propose 2 alternative arrangements to implement plan. ④
		Complete Case Report Summary Seven.

Procedures to Select Behaviors to be Modified ①

Given the time and person power constraints within a school, it is usually not possible for a SERT and other personnel to develop a program plan which includes all the discrepancies which have been identified for a student. From our experience, the behaviors that should be given the highest priority in the first phase of program modification are those showing the largest discrepancy ratios and those behaviors which have generated the greatest concern among the parties to the problem-- particularly, teacher, student, and parent.

EXAMPLE

From the Discrepancy Ratio Worksheet, the SERT identified Ricky's greatest discrepancy ratios as progress in reading (4.5X) in the Read Series; progress in the math skill sequence (3.7X); and noise in the classroom (15.0X). In consultation with Ricky, one of his parents, and other staff members, the decision was made to select progress in reading, computation of math facts, and noise in the classroom as the first behaviors for program modification. The rationale for the selection of math facts rather than progress in the skill sequence as the pinpointed behavior was based on the premise that mastery of math facts is a prerequisite to mastery of other skills in the math sequence. (See Case Report Summary Five.)

Writing Program Objectives[1] ②

In DBPM, progress/performance objectives are written for both short-range (usually daily or weekly) and long-range goals. The latter specify the desired levels of progress/performance that will entirely reduce the initial discrepancy. The daily and/or weekly goals are written as subsets of the long-range goals. Objectives are written in three steps:

STEP 1 *Compute progress/performance estimates for the behaviors.*

STEP 2 *Select an intervention period for each behavior based on the estimates.*

STEP 3 *Write the objectives.*

APPLICATION There follows an example of the steps taken by the SERT to write program objectives for Ricky for progress in the Read Series, performance in computing math facts, and performance in noise reduction in the classroom.

EXAMPLE

STEP 1 *Computing progress/performance estimates (see Tables V11-1 and V11-2).*

The procedures for computing progress/performance estimates are outlined in Chapter III as follows:

Determine the time available for the program modification.

Subtract the student's present mastery or performance level from the desired mastery or performance level at the end of the time allowed for the program modification to determine the amount of improvement needed by the student.

Divide the improvement needed (mastery or performance) by the time available for the intervention.

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[1] The rationale and procedures for writing performance objectives are not described here. Readers who are not skilled in these procedures are referred to materials such as those developed by Mager (1962) and Wheeler & Fox (1972). See also Ch. III.

EXAMPLE

In Tables VII-1 and VII-2 there are given the computations made by the SERT, first for progress estimates for three behaviors and, second, for performance estimates for four behaviors. Estimates were made for two time intervals for each behavior. Estimates of performance differ from estimates of progress only in that intervention periods are usually specified in weeks instead of months.

STEP 2 *Select an intervention period for each behavior.*

Once estimates are computed for different time periods the SERT uses the estimates to decide how long an intervention may be required to bring the pupil up to desired behavior.

The decision on the length of the intervention must be made within the context of all the information collected on the problem. The following questions should be considered:

1. How important is the behavior (i.e., has it been designated as high priority)?
2. What is the magnitude of the discrepancy? Larger discrepancies require longer interventions.
3. How much daily instructional time is available to provide service (i.e., how often will the child receive instruction--min./day, days/wk.)? If the daily time is short, a longer intervention period will usually be needed.
4. What arrangements will (or can) be made to provide service (i.e., individual vs. group)?
5. Given the student's history and the estimates for different intervention lengths, which estimates appear more realistic for this student?

The estimate provides another pertinent piece of data to aid in decision making. Given the information you presently have for Ricky, which intervention periods would you select for him in each behavior? The following were selected by the SERT:

a. Reading Progress: Reading is the highest priority behavior for Ricky's program. The SERT plans to propose that at least one-half hour of daily service in reading be provided for him. Therefore, it seems realistic to plan an intervention of 9 months rather than 18 months, given the estimate of 6.5 pages per day mastery needed to reduce the discrepancy by the end of the 9-month period. (See Table VII-1.)

b. Computation Facts: The two estimates here are for 10-week and 20-week interventions. The SERT selected the 10-week estimate of 1 fact/min. faster/week as a realistic goal. (See Table VII-2.)

c. Noise Behavior: In this instance it is more difficult to decide how much time it will take to reduce the discrepancy in Ricky's noise behavior. The SERT has not worked with Ms. B. before and is uncertain of her commitment to the consultative arrangement she would like to recommend. The behavior is of great concern to the teacher, however, and it seems important to spend time consulting frequently with a teacher to achieve success. A 9-week intervention period is selected, therefore. (See Table VII-2.)

STEP 3 *Write the objectives.*

Using the estimates selected in STEP 2, the SERT wrote long- and short-range objectives for Ricky's program.

a. The long-range objective for Ricky in reading progress was to achieve the desired mastery level in 9 months. For Ricky's age and grade, mastery level performance (see Chapter V) is to read 50 words/minute or better with 2 or fewer errors and 80% comprehension. Therefore the SERT wrote the objective as follows:

Long-Range Objective

By the end of the year (9 months), when given any three sample selections in Books C-H in the Read Series, Ricky will read at the median rate of 50 words/min. or better with 2 or fewer errors and 80% comprehension.

b. The short-range objective translates the long-range objective into daily, weekly, or monthly achievement.

For Ricky's reading progress, daily, weekly, or monthly desired mastery levels are determined by dividing all the material in the 9-month period by days, weeks, or months, depending on how the short-range goal is written. From Table VII-1, we can see that Ricky must master 6.5 pages per day, 33 pages/week, or 131 pages/month. The daily objective, therefore, was written as follows:

Daily Objective

Each day, when given successive stories from Books C-H in the Read Series, Ricky will read sample selections from 6.5 pages at the median rate of 50 words/min. or better with 2 or fewer errors and 80% comprehension.

The weekly objective would be written as follows:

Weekly Objective

Each week, when given successive stories from Books C-H in the Read Series, Ricky will read sample selections from 33 pages at the median rate of 50 words/min. or better with 2 or fewer errors and 80% comprehension.

The monthly objective would specify mastery level performance on sample selections from any of 131 pages.

Following the same three steps, the SERT wrote the long- and short-range performance objectives for math facts and noise. The objectives for all three behaviors were written on Case Report Summary Six in terms of conditions, behavior, and criteria.[2] Program changes to facilitate Ricky's achievement of the objectives were also written.

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[2] This format is used by Wheeler & Fox (1972).

Table VII-1
Progress Estimates for Ricky

BEHAVIOR	TIME AVAILABLE	IMPROVEMENT REQUIRED IN TIME	IMPROVEMENT REQUIRED IN MATERIAL	PROGRESS ESTIMATE			
				TIME	MATERIAL		
					Months	Weeks	Days[b]
READING/ READ SERIES	ONE SCHOOL YEAR (9 Months)	Desired 27 mos. Actual -4 mos. IMPROVEMENT REQUIRED 23 mos.	Books 1/3 C,D,E,F,G,H[a] = 1180 Pages	$\frac{23 \text{ mos.}}{9 \text{ mos.}}$ = 2.5 mos./mos.	$\frac{1180 \text{ pp.}}{9 \text{ mos.}}$ = 131 pp./mos.	$\frac{1180}{36}$ = 33 pp./wk.	$\frac{1180}{180}$ = 6.5 pp./day
	TWO SCHOOL YEARS (18 Months)	Desired 36 mos. Actual -4 mos. IMPROVEMENT REQUIRED 32 mos.	Books 1/3 C - I = 1710 Pages	$\frac{32 \text{ mos.}}{18 \text{ mos.}}$ = 1.8 mos./mos.	$\frac{1410 \text{ pp.}}{18 \text{ mos.}}$ = 78 pp./mos.	$\frac{1410}{72}$ = 19 pp./wk.	$\frac{1410}{360}$ = 4 pp./day
MATH/ SKILL SEQUENCE	ONE SCHOOL YEAR (9 Months)	Desired 27 mos. Actual -5 mos. IMPROVEMENT REQUIRED 22 mos.	SKILLS 2 - 37 = 35 SKILLS	$\frac{22 \text{ mos.}}{9 \text{ mos.}}$ = 2.4 mos./	$\frac{35}{9 \text{ mos.}}$ = 4/mos.	$\frac{35}{36}$ = 1/wk.	$\frac{35}{180}$ = 2./day
	TWO SCHOOL YEARS (18 Months)	Desired 36 mos. Actual -5 mos. IMPROVEMENT REQUIRED 31 mos.	SKILLS 2 - 57 = 55 SKILLS	$\frac{31 \text{ mos.}}{18 \text{ mos.}}$ = 1.7 mos./mos.	$\frac{55}{18}$ = 3/mos.	$\frac{55}{72}$ = .8/wk.	$\frac{55}{360}$ = .1/day
PHONICS/ SKILL SEQUENCE	ONE SCHOOL YEAR (9 Months)	Desired 27 mos. Actual -6 mos. IMPROVEMENT REQUIRED 21 mos.	Obj. 8 - 32 = 24 Obj.	$\frac{21 \text{ mos.}}{9 \text{ mos.}}$ = 2.3 mos./mos.	$\frac{24}{9}$ = 2.6/mos.	$\frac{24}{36}$ = .6/wk.	$\frac{24}{180}$ = .1/day
	TWO SCHOOL YEARS (18 Months)	Desired 36 mos. Actual -6 mos. IMPROVEMENT REQUIRED 30 mos.	Obj. 8 - 37 = 29 Obj.	$\frac{30 \text{ mos.}}{18 \text{ mos.}}$ = 1.6 mos./mos.	$\frac{29}{72}$ = 1.6/mos.	$\frac{29}{72}$ = .4/wk.	$\frac{29}{360}$ = .08/day

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[a] See Section 2 Figure 16 for Pages/Book

[b] For many skills a progress estimate for days yields a relatively meaningless number.

Table VII-2

Performance Estimates for Ricky

BEHAVIOR	PERFORMANCE CHANGE REQUIRED	TIME AVAILABLE	PERFORMANCE ESTIMATE (APPROX.)
COMPUTING MATH FACTS	Desired 20 /min. Actual -10/min.	10 Weeks	$\frac{10}{10}$ = 1 fact /min. Increase/wk.
	Required Increase 10/min.	20 Weeks	$\frac{10}{20}$ = .5 Facts/min. Increase/wk.
SPELLING LETTERS CORRECTLY IN SEQUENCE	Desired 45/min. Actual -15/min.	5 Weeks	$\frac{30}{5}$ = 6 Letters in Seq/min. Increase/wk.
	Required Increase 30/min.	15 Weeks	$\frac{30}{15}$ = 2 Letters in Seq/min. Increase/wk.
WRITING LETTERS (HANDWRITING)	Desired 45/min. Actual -36/min.	9 Weeks	$\frac{9}{9}$ = 1 Letter/min. Increase/wk.
	Required Increase 9/min.	18 Weeks	$\frac{9}{18}$ = .5 Letters/min. Increase/wk.
NOISE	Actual 3.0/min. Desired -.2/min.	10 Weeks	$\frac{2.8}{10.0}$ = .28 Noise/min. Decrease/wk.
	Required Decrease 2.8/min.	20 Weeks	$\frac{2.8}{20.0}$ = .14 Noise/min. Decrease/wk.

CASE REPORT SUMMARY FIVE

Program plans are summarized here.

Student	Grade	Age	Teacher
Ricky J.	3	9	Ms. B.

II. PROGRAM PLANNING

5. What program plans are proposed?
For which identified discrepancies will program plans be developed at this time?
What progress/performance is needed to reduce the discrepancies?

List discrepancies for which program modifications will be developed.

1. Progress in Read Series	4.
2. Math Facts	5.
3. Noise	6.

Summarize estimates of progress/performance needed to reduce the discrepancies here.

BEHAVIORS / TIME	9 mos.	18 mos.	5 weeks	9/10 weeks	18/20 weeks
Reading	131 pages/mos.	78 pages/mos.			
Math Facts				1 Fact Faster/min.	.5 Facts Faster/min.
Noise				.28/min. decrease/wk.	.14/min. decrease/wk.

CASE REPORT SUMMARY SIX

Program objectives and proposed changes for each objective are summarized here.

Student	Grade	Age	Teacher
Ricky J.	3	9	Ms. B.

5. What program plans are proposed? (cont.)
What program objectives are proposed?
What program changes are proposed?

List long-range, weekly, daily objectives and program changes for each program modification here.

Reading

	CONDITIONS	BEHAVIOR	CRITERIA
Long Range Behavior	By the end of the year when given selections from any three stories in Book C-H in the Read Series	Ricky will read the selections	At a median rate of 50 words/minute or better with 2 or fewer errors and 80% comprehension.
[✓ Daily] or Weekly Behavior	Each day when given successive stories from Books C-H	Ricky will orally read simple selections from six pages	At the same criteria as above.

Change 1 Practice silent reading 15 min. daily before oral reading.
Change 2 Token Economy: Points will be earned for each day Ricky masters 6pp. 500 points = model car.
Change 3 Ricky will set own daily mastery goals.

Math

	CONDITIONS	BEHAVIOR	CRITERIA
Long Range Behavior	At the end of a 10-week period given 3 sheets of randomly selected math facts	Ricky will write answers to these facts	At a median rate of 20 facts/minute with 2 or fewer errors.
Daily or [✓ Weekly] Behavior	Each week given a sheet as specified above	Ricky will write answers	At a rate which is 1 fact faster/min. than the previous week.

Change 1 Oral flash card practice - 10 mins. daily
Change 2 Written math facts practice - 10 mins. daily
Change 3 Token Economy: Points for each additional fact over the weeks total. Points will be added to those being earned in reading.

Noise

	CONDITIONS	BEHAVIOR	CRITERIA
Long Range Behavior	At the end of a 10-week period during quiet work time in class	Ricky's noise behavior will	be at the same level as peers.
Daily or [✓ Weekly] Behavior	Each week during the time specified above	Ricky's noise behavior will	decrease by .28/min.

Change 1 Contract
Change 2 10 minutes daily to play with cars.
Change 3 Choose a friend to play with for 10 mins.

Guidelines for Specifying Program Changes ①

If the problem you are attempting to solve requires a change in student performance and you are looking for some guiding principles to help you decide what program plans (changes) to make, keep the following six guidelines in mind:

1. *Always try as a first change talking with the student*, *clearly*
   a. *showing* him the performance that you desire, and
   b. *explaining* to him who thinks the behavior is important and why they believe it is important.
2. *Arrange ample opportunity for the student to practice each day on the behavior you are measuring.*

In effect, this second guideline means that you should so organize instruction that the student can spend most of the daily lesson time practicing on the test task. For example, if you are attempting to improve word-recognition proficiency and you are obtaining a daily measure of "saying words in context" (oral reading), then most of the daily lesson should focus on practice at reading orally the same words, essentially, as those in the test passages. Of course, if you are testing for improvement in recognizing words in unfamiliar passages, then the practice passages must be different from the test passages. The principle would hold true for practice and testing on any task in any content area.

This second guideline is especially important when a program is being changed. Observations have revealed that children who are performing poorly on academic tasks spend little if any time actually working directly on the skills in which they are deficient. The guideline is also important in the development of programs to influence social behavior, and for the same reasons. If you are attempting to increase the frequency of a child's interactions with his peers you must arrange for ample opportunity for him to practice at social interaction.

3. *Have the student set improvement goals and monitor (graph) his own progress each day.*

Because we are concerned with improving student performance we tend to assume too much responsibility for effecting a change. When we assume this responsibility we remove the student from the central role he can (and should) play in changing his own behavior. Involving a student in both setting goals and monitoring his progress through graphing secures active involvement in self-improvement. (See Starlin, 1972, and Ch. II.)

4. *Examine the student's performance graph with the student each day and point out, encourage, and praise (socially reinforce) improvement.*

An individual can improve his performance in isolation but, generally, it is more fun to learn with people than alone. More important, perhaps, are the social consequences of behavior which may be the most durable set of influences for behavior change and maintenance. As you cycle through guidelines 1-3 above, you will necessarily be interacting with the student and social reinforcement should occur naturally. We need to emphasize the importance of social consequences (not just praise) for improvement, however, and to be clear that those consequences are related to improving performance rather than to practicing on the task.

NOTE:

The four guidelines recommended above constitute a set of changes against which all other program changes should be tested. We often have found that these changes alone are enough to produce improvement and that they can constitute the *basic intervention plan*. By recommending this set, we are challenging you to try to find additional changes that will, in fact, improve a student's program beyond the set recommended in guidelines 1-4. Other changes will be found to be more effective but this basic set of guidelines is the standard.

5. *Be sure to arrange different consequences for different amounts of improvement as one set of program changes.*

As teachers, we often assume that performance can be improved by a new piece of curriculum or a new teaching method. We tend to view all academic problems as skill deficiencies. In so doing, we overlook the enormously powerful influence of motivation on improving performance. If desirable consequences (free time is one of the best) are made available to the student contingent upon gradual improvement, reasons are created for him to manipulate his own instruction in the way that best suits him. You may be surprised to find that apparent skill deficiencies disappear rapidly if the student has good reasons to eliminate them. One surprise for us has been the rapid disappearance of "reversals" in words, letters, and numerals which has occurred through arranging contingent consequences for correctness.

6. *Use other students in a teaching role whenever individual instruction is necessary.*

A significant body of literature exists on the effectiveness of children as teachers. Careful recruitment and training of students as teachers enormously increases for the student who has difficulty both the available instructional resources and the opportunities for social reinforcement in learning. Peer cooperation facilitates the development of academic skills in both the tutor and tutee; it is also an occasion for increased personal-social development.

Various arrangements which can be added to the "basic set" to create program modifications are shown in Table VII-3. A detailed list of change strategies is given in Appendix C.

EXAMPLE

The first set of changes proposed by the SERT for Ricky's program included the following:

1. Development of a contract (Fig. VII-1).
2. Development of a Token Economy.[3]
3. Practice on the task.

The proposed changes are listed in Case Report Summary Six. Note that these changes do not call for the implementation of alternative curricula. Contrary to other approaches, DBPM procedures try to maintain cohesiveness with existing programs as the first steps in program modification. The proposed changes are systematically tested during program implementation. Adjustments are proposed as the data on these changes are collected and their effectiveness in reducing the discrepancies is evaluated.[4]

④ Procedures to Determine Alternative Administrative Arrangements

The selection of a program may not be restricted only to instructional materials, procedures or incentives: where possible, physical or administrative arrangements should also be negotiable. In Fig. VII-2 eight styles of service are shown.

The distinction is made in the illustration between direct and indirect service. *Direct service* refers to program modifications which are planned and implemented by the SERT. *Indirect service* refers to program modifications which are planned and implemented by others (usually,

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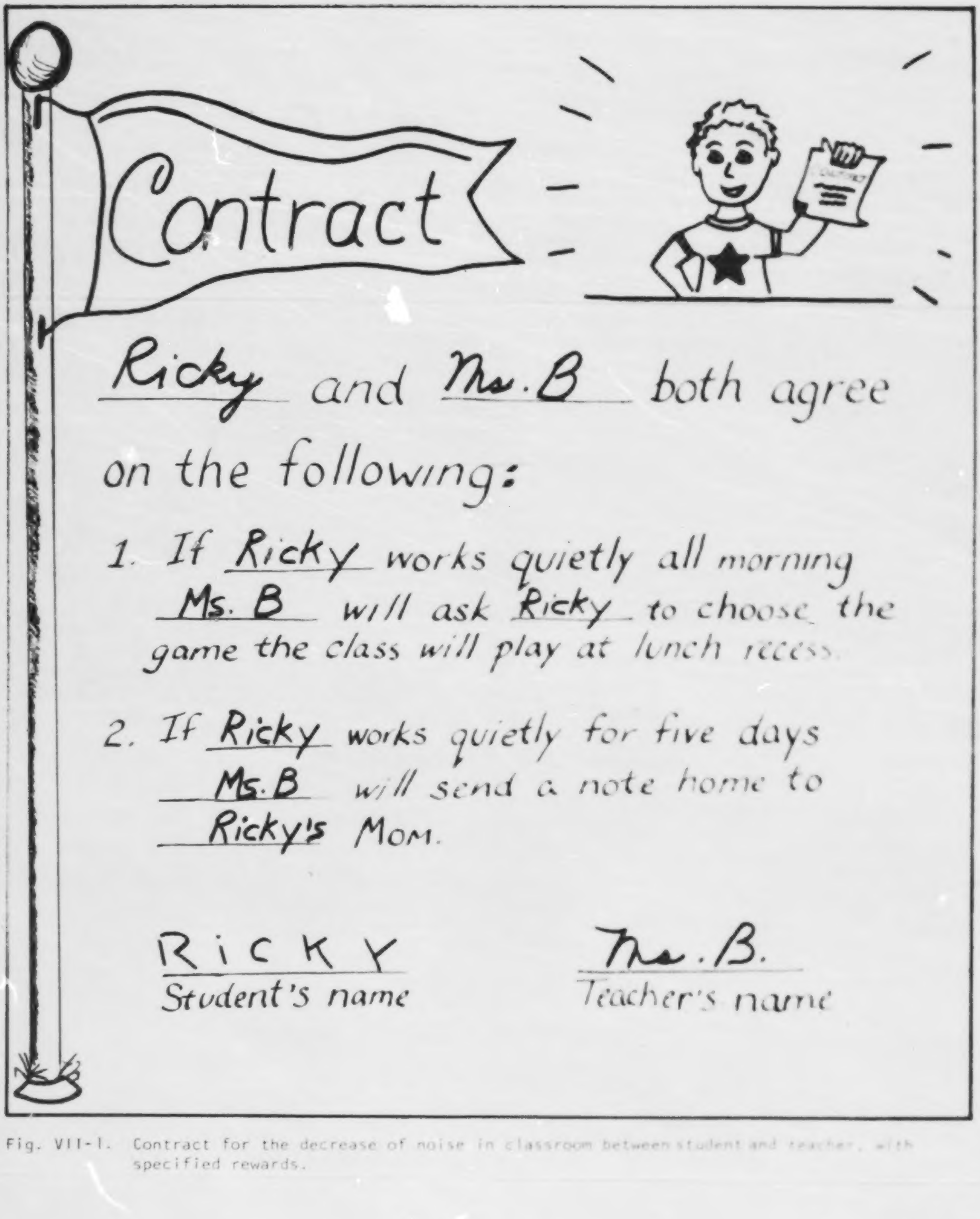
[3] See Homme (1970).

[4] Program implementation and adjustment are discussed in Part IV.

Table VII-3

Arrangements That May Increase or Decrease Behavior

To Increase:	Definition	Example
1. Reinforcement	1. An increase in behavior produced by consequences:	Increasing completion of school tasks by:
a. Social	a. social events delivered by someone else	a. Praising, attending to, interacting with, or touching someone who completed his schoolwork
b. Activity	b. doing something which is preferred or desirable	b. Increasing correct problem solving by allowing students 3 minutes free time for every 10 problems solved correctly
c. Concrete	c. receiving edible or material awards	c. Increasing spelling accuracy by awarding "Snoopy Stickers" for spelling 9 of 10 words correctly
d. Indirect	d. tokens or symbols which are exchangeable for other consequences	d. Increasing "in seat" behavior by occasionally giving points to students in their seats to exchange for social, activity, or concrete consequences
2. Prompting (Priming)	2. Making changes in the cues for behavior to increase the chances it will occur	
a. Verbal	a. saying or writing directions, explanations, or instructions for performance	a. Saying "Everybody watch me and I'll show you a picture"
b. Nonverbal	b. doing something to ensure performance	b. Writing in the air, tracing, counting on fingers
c. Modeling	c. presenting an example of the desired performance	c. Presenting a syllable card, saying "This is sat, now you say it"
3. Shaping	3. Gradually building a desired performance by beginning with behavior already in the student's repertoire	
a. Shifting criterion	a. increasing the duration, percentage, or frequency necessary for reinforcement	a. Increasing by 5 minutes the amount of continued "in seat" behavior necessary to earn a token
b. Chaining (task analysis)	b. requiring that two or more smaller behaviors occur in sequence for reinforcement	b. Teaching single syllable regular words and requiring the student to "sound out" polysyllable words
To Decrease:	Definition	Example
1. Extinction	1. A decrease in performance produced by withholding consequences which have previously reinforced that performance	1. Decreasing "in seat" behavior by never paying any attention to it or praising it
2. Time out	2. A decrease in performance produced by not allowing any behavior to occur& be reinforced as a consequence of that performance	2. Decreasing "throwing objects" by having the student sit by himself in the back of the room for 5 minutes as a consequence
3. Punishment	3. Decreasing performance by making a consequence contingent upon that behavior	3. Decreasing completion of worksheets by giving additional work to students when they complete their worksheets
4. Response Cost	4. Decreasing performance by taking away something as consequence for performance	4. Decreasing "hitting" by having student lose tokens for hitting
5. Incomptatible Behaviors	5. Decreasing one behavior by reinforcing another behavior which, if it occurs, interferes with doing that behavior	5. Decreasing "out of seat" behavior by awarding tokens for being in the seat



Contract
CONTRACT

Ricky and Ms. B both agree on the following:

1. If Ricky works quietly all morning Ms. B will ask Ricky to choose the game the class will play at lunch recess.

2. If Ricky works quietly for five days Ms. B will send a note home to Ricky's Mom.

RICKY
Student's name

Ms. B.
Teacher's name

Fig. VII-1. Contract for the decrease of noise in classroom between student and teacher, with specified rewards.

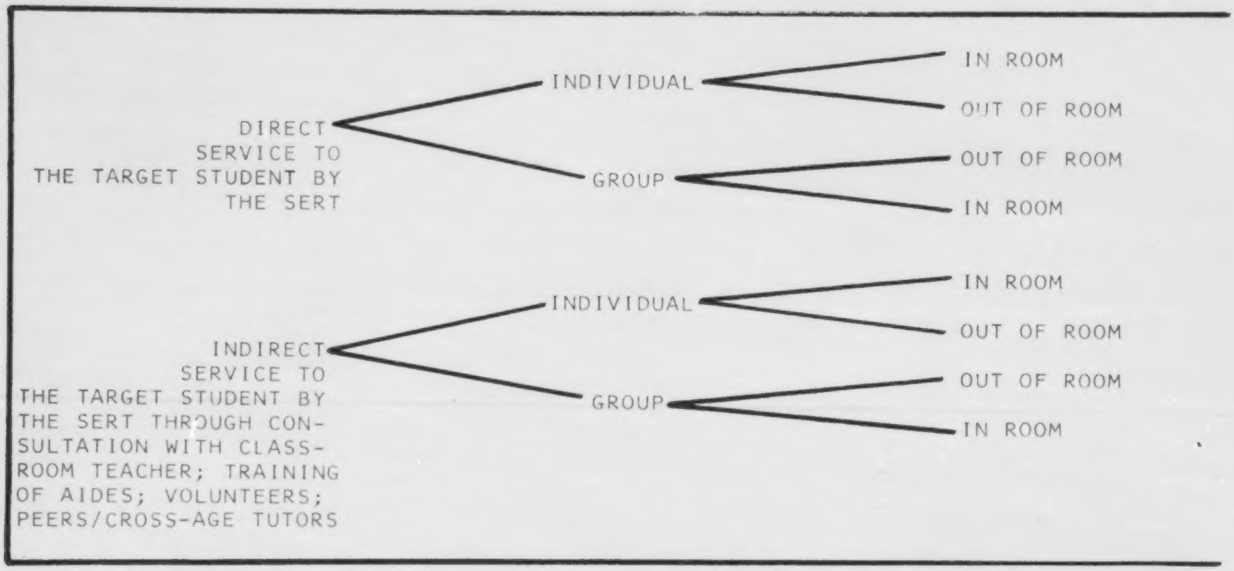

DIRECT SERVICE TO THE TARGET STUDENT BY THE SERT
INDIVIDUAL
IN ROOM
OUT OF ROOM
GROUP
OUT OF ROOM
IN ROOM
INDIRECT SERVICE TO THE TARGET STUDENT BY THE SERT THROUGH CONSULTATION WITH CLASSROOM TEACHER; TRAINING OF AIDES; VOLUNTEERS; PEERS/CROSS-AGE TUTORS
INDIVIDUAL
IN ROOM
OUT OF ROOM
GROUP
OUT OF ROOM
IN ROOM

Fig. VII-2. Alternative administrative arrangements: eight styles of special education service within the mainstream. (Adapted from E. Joseph, A description and an implementation evaluation of the Seward-University Project. Unpublished Master's paper, Department of Psychoeducational Studies, University of Minnesota, 1974.)

classroom teachers) in consultation with the SERT, or in which the SERT trains others to implement the program plans. (Specific procedures for consulting with classroom teachers and training others to implement DBPM are discussed more fully in Part VII.)

Different administrative arrangements may be appropriate for different content areas. The decision on which arrangement to propose or accept should be a collaborative one between the classroom teacher and the SERT, with due consideration given to selecting the arrangement which is the appropriate and "least restrictive" one for the particular student.[5]

EXAMPLE

For Ricky, two alternative administrative arrangements were proposed by the SERT for each academic behavior. Only one arrangement was proposed for social behavior.

Reading:

Arrangement 1. Daily direct service by SERT in regular classroom.

Arrangement 2. Daily indirect service by peer tutor monitored by SERT in resource room.

Math:

Arrangement 1. Daily direct service by SERT in regular classroom.

Arrangement 2. Daily direct service with three other pupils by SERT in resource room.

Noise:

Arrangement 1. Indirect service by SERT through consultation with classroom teacher (see Fig. VII-1).

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[5] The definition of least restrictive alternative, as given in P.L. 94-142, clearly establishes the policy of educating all handicapped children "to the maximum extent appropriate" with children who are not handicapped.

CASE REPORT SUMMARY SEVEN

Student	Grade	Age	Teacher
Ricky J.	3	9	Ms. B.

5. What program plans are proposed? (cont.)
What resources are available to implement the plan?

Propose several possible program arrangements here

Behavior	Program Arrangement	Type of Instruction	Time	Implementors	Place
Reading	1	[✓ Direct] Group Indirect [✓ Individual]	10:30- 11:00 Daily	[✓ SERT] AIDE CLASS TEACHER OTHER PEER	Resource Room [✓ Classroom] Other
	2	Direct Group [✓ Indirect] [✓ Individual]	Same as above	[✓ SERT] AIDE CLASS TEACHER OTHER [✓ PEER]	[✓ Resource Room] Classroom Other
Math	1	[✓ Direct] Group Indirect [✓ Individual]	11:00- 11:15 Daily	[✓ SERT] AIDE CLASS TEACHER OTHER PEER	Resource Room [✓ Classroom] Other
	2	[✓ Direct] [✓ Group] Indirect Individual	11:00- 11:30 Daily	[✓ SERT] AIDE CLASS TEACHER OTHER PEER	[✓ Resource Room] Classroom Other
Noise	1	Direct Group [✓ Indirect] [✓ Individual]	A.M.	[✓ SERT] AIDE [✓ CLASS TEACHER] OTHER PEER	Resource Room [✓ Classroom] Other
	2 (None)	Direct Group Indirect Individual		SERT AIDE CLASS TEACHER OTHER PEER	Resource Room Classroom Other

Date Completed 9/27/75

By SERT

Overview: Measurement

Measuring progress on a daily, weekly, and monthly basis has been demonstrated to be a critical component of DBPM. To insure uniformity of measurement throughout the program as part of the program plan, the SERT must specify which of the graphs developed during initial assessment will be maintained during the program and how often and in what manner the data will be collected. Additional graphs may also be constructed if they are needed.

DECISION AREA: Program Selection
PROGRAM PHASE: Program Planning

PROCESS: Measurement

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
6. How will effectiveness of program plan be measured?		
What procedures will be used to measure progress/performance?	Guidelines to select measurement procedures. ①	Specify procedures to measure behaviors and frequency of data collection on Case Report Summary Eight. ①
How often will data be collected?		
What progress/performance is estimated?	Procedures to draw projected progress/performance estimate on graphs. ②	Draw projected progress/performance estimates on graphs. ②

Guidelines to Select Measurement Procedures ①

Several factors must be considered in the selection of the method and frequency with which data are collected:

1. The opportunity available to measure the behavior (i.e., the frequency with which the behavior can occur). If the student is seen for instruction only weekly, a daily measure is ruled out obviously.

2. Whether progress *or* performance is being measured. Progress graphs usually span longer periods of time and measurement may be less frequent.

3. The frequency with which the behavior is likely to change. Behaviors that change frequently should be measured more frequently. A general rule of thumb is that the more frequent the measurement, the greater the sensitivity of the measures to changes in progress/performance.

EXAMPLE

In Case Report Summary Eight, there are listed the procedures that will be used by the SERT to measure Ricky's progress/performance. Note that in addition to the monthly progress graph for reading in the Read Series, which was developed during initial assessment, the SERT will maintain a daily progress graph as well. In this instance the daily progress graph will help to monitor the estimated daily mastery goal of 6.5 pages/day.

For math facts and noise behavior, the graphs developed during initial assessment will be continued.

Reading

1. On the first day of each month the SERT will plot a point on the monthly progress graph to represent the mastery level which Ricky has achieved.

2. Each day Ricky reads, the number of pages mastered will be determined by the mastery criterion (50 words or better/min. with 2 or fewer errors and 80% comprehension) on a randomly selected paragraph from the pages. These pages will be added to the cumulative total on the daily progress graph.

Math Facts

Each day Ricky will respond orally for one minute to a randomly selected set of addition and subtraction math facts with sums from 0-19. The number answered correctly and incorrectly/min. will be entered on the graph.

Social Behavior

Each week the SERT will observe Ricky and his peers in the classroom for 10 minutes daily for noise behavior. Ricky will be observed for 5 alternate minutes and his peers for 5 alternate minutes. The data will be summarized and entered on the graph by the SERT and subsequently shared with the teacher during consultation.

This information is summarized in Case Report Summary Eight.

② Procedures to Draw Projected Progress/Performance Lines on Graphs. See Chapter III.

EXAMPLE

The projected estimates made by the SERT for Ricky's three pinpointed behaviors were added to the relevant graphs.

Reading. The intervention period selected by the SERT for Ricky's accelerated progress in the Read Series is 9 months. At the end of this period, desired mastery for Ricky is completion of third-grade reading level or Book I. This point is shown as Δ on the graph at the intersection of end of grade 3 (27 months) and Book I. Ricky's present mastery level is the fourth month of first grade or two-thirds of the way through Book C. This point is shown as ○ on the graph at the intersection of beginning of grade 3 and page 60 in Book C. A dotted broken line (-·-·-·-) is drawn between ○ and Δ. See Graph 12c.

The estimated progress for the 9-month intervention period is based on mastery of 6.5 pages per day. To monitor Ricky's daily progress, the SERT set up a daily progress graph in reading. On the vertical axis, the SERT listed the books and pages in the Read Series with each line representing 6.5 pages, beginning with page 60 in Book C. Thus, the total pages on the vertical axis equal 637 (40 pp. for Book C, the total of 100 less 60; 190pp. for Book D; 222 pp. for Book E; and the first 185 pp. of Book F) to be mastered in the 98 days of the 20-week intervention period. The weekly dates were written in on the horizontal axis.

SERT planned on starting the intervention in reading during the week of September 23. Thus the SERT estimated that the 20-week intervention period would end February 19. Therefore, the SERT placed Δ at the intersection of 646 pages and 20 weeks after the start of the intervention: ○ was placed on the graph at the starting date of the intervention. A dotted broken line (-·-·-·-) was drawn to connect the two points. See Graph 12c-1.

At the end of 20 weeks, a new graph of daily progress will be organized to start with p. 186 of Book F, and a new estimate of progress will be drawn, as in Graph 12c-1.

Computing Math Facts. The SERT had chosen a 10-week intervention for Ricky for the computation of math facts. Using the equal ratio performance graph, the SERT marked off 10 weeks from

CASE REPORT SUMMARY EIGHT

Measurement procedures to be used in the program are summarized here.

Ricky J.	3	9	Ms. B.
Student	Grade	Age	Teacher

6. How will effectiveness of the program plan be measured?
What graphs will be maintained for the program?
How often will data be collected?

Behavior to be measured	How materials are organized	What the teacher says	What the student does	Type of graph	Frequency of measurement	What is recorded on the graph
Reading	Random selection from 6.5 pages in Read Series (Books C-H).	Read this page while I time you for 1 min. Then I'll ask you some questions.	Reads the selection for 1 min. Answers questions.	[✓ Progress] Performance	[✓ Daily] Weekly [✓ Monthly]	# of pages mastered # of books mastered
Math Facts	Printed page of 50 randomly selected addition and subtraction math facts with sums 0-19.	Please write the answers to these math facts.	Writes answers for 1 minute.	Progress [✓ Performance]	[✓ Daily] Weekly Monthly	# correct/incorrect per minute.
Noise in Classroom	Ricky and peers in classroom.	Teacher observes for 10 minutes.	Regular class-work.	Progress [✓ Performance]	Daily [✓ Weekly] Monthly	per min. rate of behavior for Ricky and Peers.

This case report summary is an adaptation of a recording format presented by J. E. McCormack, Jr., The assessment tool that meets your needs: The one you construct. *Teaching Exceptional Children*, 1976, *8*(3), 106-109.

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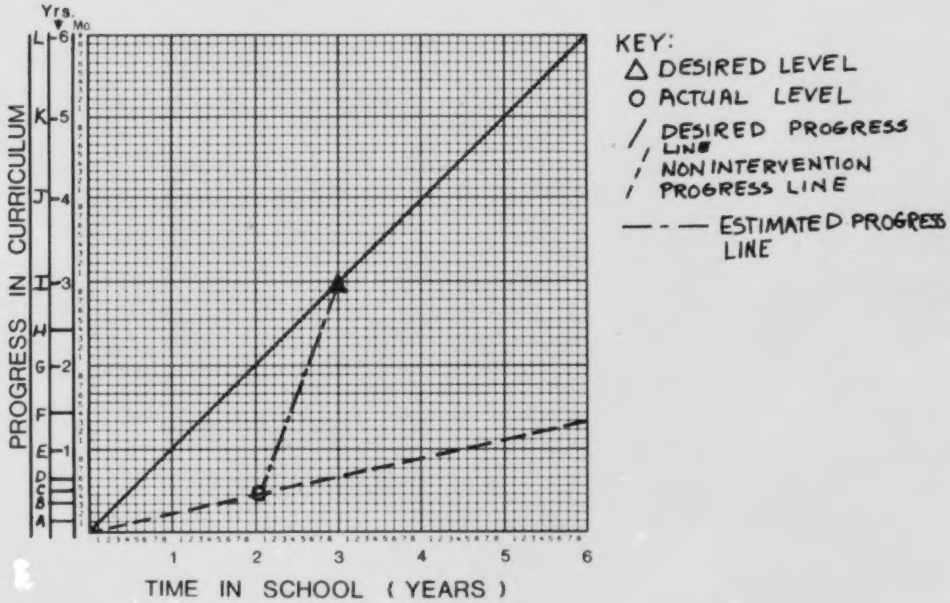
placed a △ at the intersection of the line representing 10 weeks after the start of the intervention and the line representing 20 facts/min., and a ○ at the point representing the present median. A - - - was drawn to connect the two points. See graph 15b.

STUDENT: RICKY SCHOOL: RIVER RUN CURRICULUM: READING



Graph 12c. Monthly progress graph, Read Series, showing nonintervention progress line and estimated progress line, for Ricky.

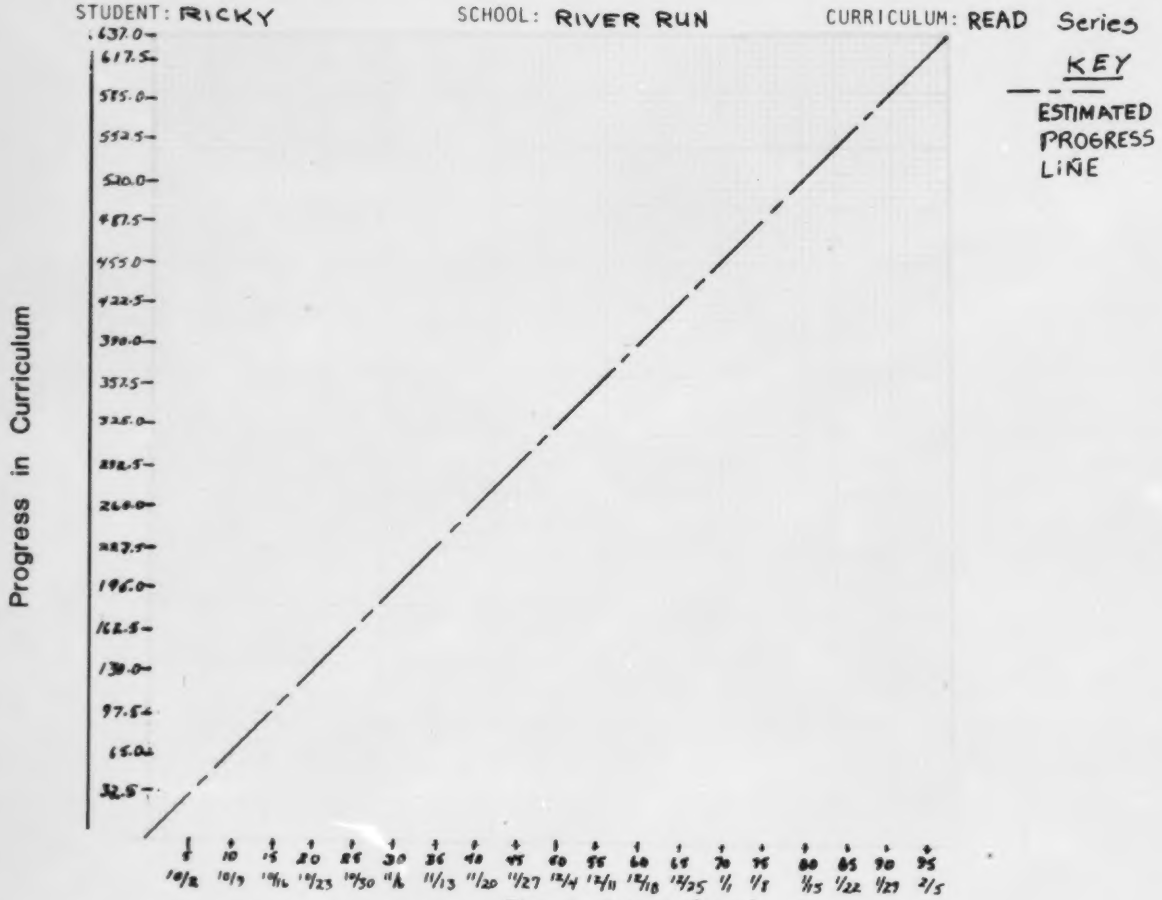
Noise. For noise a nine-week intervention period was selected. At the end of this time period desired noise behavior for Ricky is .2/minute (Peer noise behavior). This goal is shown on the graph as a △ at a point nine weeks following baseline at the .2 line on the graph. A dotted line -·-·-·- was drawn from the present median of 3, represented by a ○, to the △. See Graph 19b, page 148.

The SERT then completed Case Report Summary Eight listing the specific activities for measurement and data recording for each behavior.

PROCESS: Communication and Collaboration

DECISION AREA: Program Selection
PROGRAM PHASE: Program Planning

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
7. Does the program plan meet the expressed needs of referrer; student; parent; others?	Purpose of program plan review. ①	
Have all parties been involved in planning?	Form to receive feedback on program plan. (Case Report Summary Nine) ②	Circulate Case Report Summary Nine to interested parties.
Have all parties accepted plan?		Arrange program plan staffing if required. ②



Graph 12c-1. Ricky's daily progress in Read Series showing estimated progress line for intervention.

Purpose of program plan review. ①

The program plan review is designed to insure systematic feedback on the extent to which the planned program is meeting the expressed needs of all parties, and to permit some choice about which administrative arrangements will be implemented. Thus the collaborative nature of planning is confirmed.[6]

Program plans must adequately reflect the concerns articulated during the problem selection phase of the program. The exhaustive nature of these activities can be justified only if the resulting plan is more appropriate for the student and satisfactory to the student, teachers, parents, and others than would otherwise have occurred. To expedite implementation of the program, the plan is circulated to the relevant persons and their approval, reactions, and preferences are solicited. If the administrative arrangements selected by all the parties is not the same or the program objectives or changes are rejected, these differences are reconciled informally or at a review meeting until agreement is achieved.

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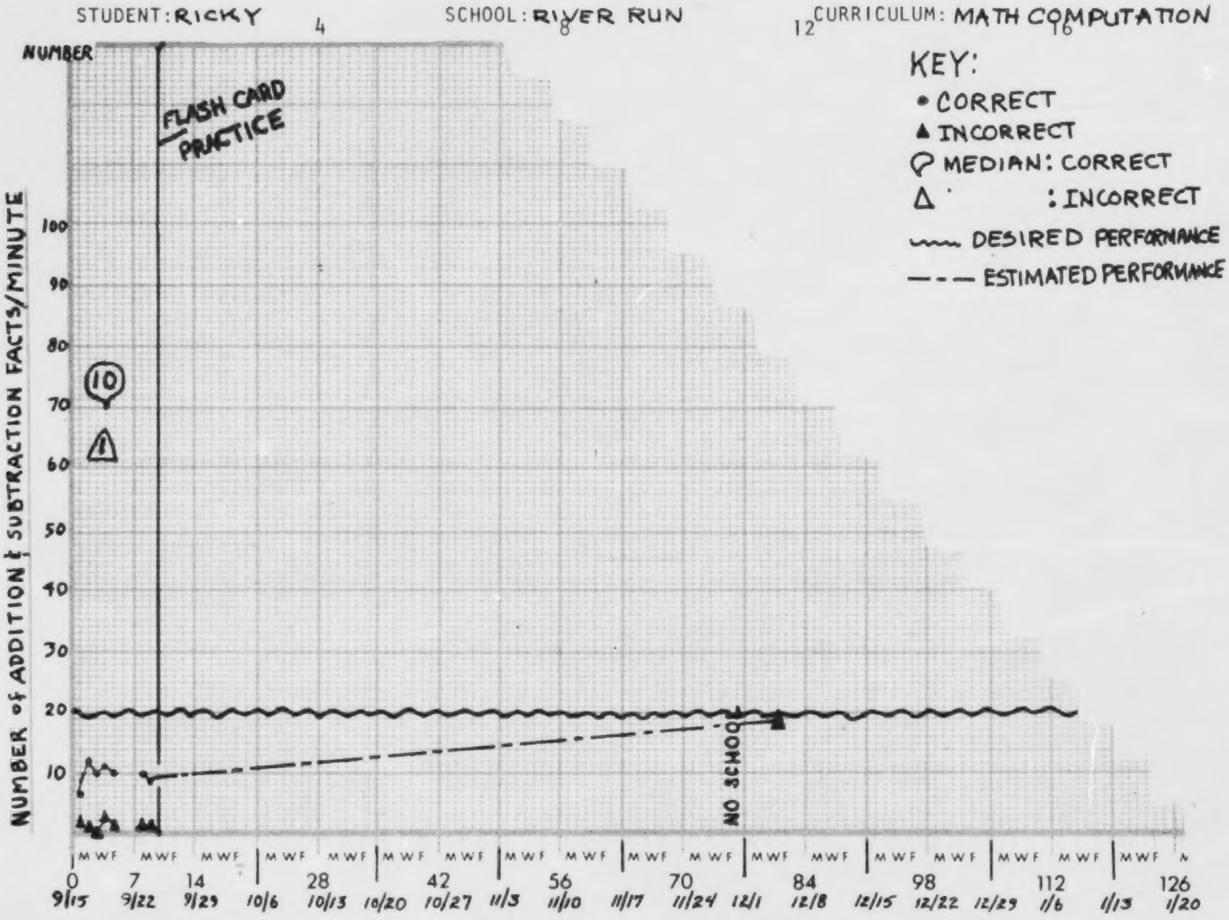
[6] P.L. 94-142 guarantees parents the right to participate in all decisions regarding their child's program, including the right to participate in planning the educational program.



Graph 15b. Daily performance graph for computation of math facts/min., for Ricky.

EXAMPLE

The plan the SERT developed for Ricky and summarized in Case Report Summaries Five, Six, Seven, and Eight was circulated to the team for approval. The SERT and the classroom teacher then held a conference with Ricky and his mother. The plan was explained and both Ricky and his mother were asked which administrative arrangement they preferred and whether program objectives and changes seemed appropriate. Their preferences are shown in Case Report Summary Nine.

CASE REPORT SUMMARY NINE

This form is used to solicit and record feedback on program plan from interested parties.

Ricky	3	9	Ms. B.
Student	Grade	Age	Teacher

7. Does the program plan meet the expressed needs of the referrer? student? parent? others?
Have all parties been involved in planning?
Have all parties accepted plan?

Directions:
Circulate proposed plans (Case Report Summaries Five, Six, Seven, and Eight) to interested parties and solicit their program plan preferences on the form below.[1]

Enclosed are the plans which have been proposed for Ricky's program. Please read them and indicate your approval or disapproval of the plan and your choice of administrative arrangement. If you have concerns about the plan which need to be communicated in person, please stop in to see me in the resource room any morning before the start of school or call me at 373-3091. If plans are not satisfactory a team meeting will be arranged.

SERT
SERT

9/27/75
Date

I have read the enclosed plans.

My preference is as follows:

		Preferences			
Behavior	Program Arrangement	Class Teacher	Parent	Student	Other Team Members
Reading	1. Direct; individual	✓	✓		No preference
	2. Indirect; individual			✓	
Math	1. Direct; individual				
	2. Direct; group	✓	✓	✓	
Noise	1. Indirect; individual	✓	✓	✓	
	2.				
ACCEPT	PROGRAM OBJECTIVES AND CHANGES	✓Ms. B.	✓Ms. J.	✓Ricky	
REJECT					

Please return to the SERT's mailbox as soon as possible so that the program may begin.

Program Plan: Accepted 9/28/75
Date

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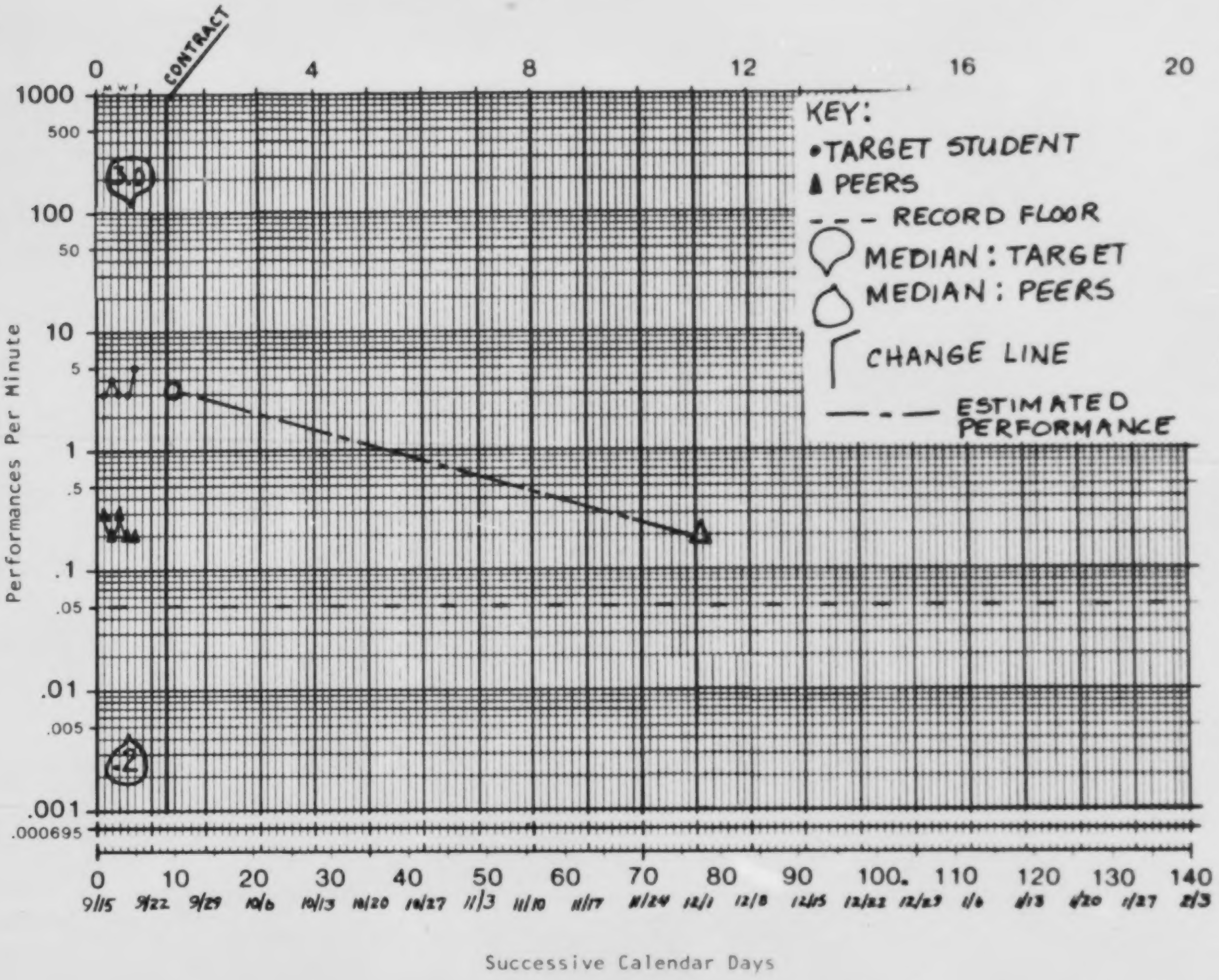
[1] To meet requirements of P.L. 94-142 a staffing may be necessary here.

STUDENT: Ricky SCHOOL: Read Series CURRICULUM: Noise



Graph 19b. Daily performance graph for Ricky and peers noise in classroom showing estimated performance line for intervention.

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PART IV

Developing Skills in DBPM:
Program Operationalization Phase

The best laid schemes
o' mice an' men
Gang aft a-gley.

Robert Burns

Introduction

The four key elements in the program operationalization phase of DBPM are as follows:

1. Goals must be clearly identified and progress on the goals must be measured frequently.

A major reason for instructional failures is that goals are only generally defined and progress is measured only occasionally (Bohannon, 1975; Hofmeister & Crutcher, 1975; Jenkins & Gorrafa, 1974). Although teachers often believe that daily interaction with students provides sufficient basis for evaluating student progress, the belief is founded on faith, not facts. Goal setting and measurement, which are discussed in earlier sections of this manual, are essential to any attempt to change students' progress/performance.

2. A program must be held constant long enough for its effects to appear.

When teachers decide to initiate new programs for children with learning difficulties, it is not unusual for them to change different aspects of the programs on an almost daily basis in their zeal to make a difference in the children's progress/performance. Such frequent changes in instruction are self-defeating, however, for two reasons: (a) the effects of the changes cannot be evaluated and thus (b) any potentially beneficial change may be discarded before it is identified. Often, teachers attempting DBPM for the first time find it difficult to be consistent in daily instruction because they feel frustrated when immediate results are not apparent. Yet, once they conquer these initial frustrations, the same teachers find it possible and rewarding to adhere to systematic consistency.

3. Data should be used to make program-change decisions, but some aspect of the program should be changed every 15 school days (3 weeks) or after 15 data points, whichever comes first.

We recommend as "a rule of thumb" that a program change be made any time three successive data points fall below the projected progress/performance line (Bohannon, 1975). We also recommend that regardless of how well the program may be going, some aspect of the program be changed every 15 school days or data points, whichever comes first.

These recommendations are not difficult to follow, given that most teachers change many aspects of programs daily. However, it may be tempting to hold a program constant when a change is leading to problem solution. Still, we cannot know whether a current program is the best possible one unless we regularly make changes (every 15 days or data points) in at least some aspect of the program to see whether an improvement is possible. Call this procedure "tinkering," if you like, but it is an essential procedure in DBPM. Remember, we are suggesting program evolution not revolution. For example, simply increasing or decreasing the amount of time that is spent each day on a particular instructional activity is a change, and it may lead to improvement. When you make a change that decreases progress toward goal attainment, you are always free to change back to your previously more successful program after plotting three successive data points below the line--and that is another change!

4. Periodically review program activities to insure that the program is being implemented according to plan and is agreed upon by those concerned with the referral.

The effectiveness of a carefully planned and selected program can be tested only if it is fully implemented. We find often that a true test of a program has not been made because the people who are responsible for carrying out important aspects have not done so according to the plan. With periodic reviews, the extent to which the program as planned is being implemented can be evaluated and any differences which are detected can be reconciled. Periodic reviews increase the likelihood that an adequate test of a potentially beneficial program will be made. In addition, by formalizing communication among the persons interested in the student's program, periodic reviews prompt and reinforce the sharing of responsibility which was initiated during problem and program selection.

These four points are discussed in detail in Chapter VIII.

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Chapter VIII

PROGRAM OPERATIONALIZATION: MEASUREMENT, EVALUATION, AND COMMUNICATION AND COLLABORATION

Decision Area:
Program Operationalization

Program Phase:
Implementation Evaluation

Contents

Measurement

Evaluation

Communication and Collaboration

Overview of Measurement

During program operationalization, measurements are taken on the behaviors which have been selected for modification in the agreed-upon program plan.

The guidelines for managing these data-collection activities and the decision rules for making program changes are discussed in this chapter.

PROCESS: Measurement

DECISION AREA: Program Operationalization
PROGRAM PHASE: Implementation Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
9. Is program being implemented as planned?		
Are measurements being taken? Are graphs being maintained for each pinpointed discrepancy? Are data being recorded as planned?	Guidelines for implementing data collection activities. ①	Measure progress/performance. Plot data on graphs. ①
Are program changes being made based on graphed data? Are changes noted on graphs?	Decision rules for making program changes. ②	Make program changes based on data. ②

① Guidelines for Implementing Data-Collection Activities

The following list of guidelines is not exhaustive but it suggests some positive approaches for decreasing implementation problems.

When the SERT Collects the Data

During implementation, data are collected and recorded so that program-change decisions can be made. Here are some guidelines to help to organize data-collection activities.

1. *Choose the graphs you will use carefully.*

Try to keep no more than four graphs for any one student on the behavior(s) of interest. For example, if improving reading skill of newspapers is the behavior of interest, measure this behavior only. It is not necessary to graph phonics skills if you have chosen to teach phonics as an intervention to improve oral reading of newspapers.

2. *Be organized.*

a. Keep each student's graphs in a folder with his daily work for easy access.

b. Encourage students to assume responsibility; let them bring their folders to the SERT when the lesson begins and return them when the lesson is over.

c. Keep timers and pencils accessible; wear them around the neck, for example.

d. Record data directly on the graph when the measurements are taken. Do not allow data to accumulate on separate sheets of paper. Transcribing information is more time consuming and it is aversive enough to insure that it will not be done.

e. Each time a change is made in the student's program draw a vertical line half-way between the last data point of the previous change and the first data point of the new change. Label the change directly on the graph.

f. Compute the discrepancy for each change directly on the discrepancy worksheet.

g. Include the necessary time for collecting data in your lesson plan. Do not try to fit it in if there is time left over!

h. Set aside a regular time period to summarize and review data. Again, do not try to fit it in. Summarizing and reviewing data must become a valued and legitimate preparation activity.

3. *Train others to collect data* (see Part VII).

a. Train students, peers, cross-age tutors, and volunteers to collect and record data. It has been demonstrated by Starlin (1972) and others that even first graders can be taught to graph data!

b. Persuade the math teacher to develop a unit on graphing which will be taught in the classroom for 15 minutes each day and include practical experience.

4. *Persuade others of the usefulness of data collection for sharing, reporting, and accountability.*

a. Using data decreases the amount of time it takes to make program decisions. One look at the graph is usually all that is needed to determine whether a program change is warranted.

b. Whenever you can, summarize data on the Discrepancy Ratio Worksheet for parent conferences and staffings. "One look is worth a thousand words."

c. Include the graphs and Discrepancy Ratio Worksheet in the student's permanent file to decrease the duplication of record-keeping activities.

When Someone Other Than the SERT Collects the Data

Since the SERT assumes personal responsibility for insuring that programs are implemented as planned, it may be valuable to review some of the common problems SERTs have encountered in trying to help others manage the data-collection activities. These problems and some possible solutions are discussed briefly in Table VIII-1. The list is not exhaustive, of course. In Part VII on consultation and training, further discussion is presented on how to solve discrepancies between program plans and program implementation when others are implementing the program.

Table VIII-1

Implementation Problems and Possible Solutions

Problem	Explanation Offered	Solution by SERT
1. The program is implemented but progress/performance is not measured.	Implementor cites lack of time; concern for extent to which measuring performance detracts from instruction.	Trains students, peers, cross-age tutors, volunteers, and aides to measure performance. Observe measurement procedures and help to develop more efficient methods, if possible. Offer training in evaluation procedures as a method to improve instruction and not to detract from instructional time. Manage the implementor's class for a few minutes each day initially while he/she measures performance, and then gradually withdraw. Prompt and socially reinforce all measurement attempts by the implementor.
	Student objects to having performance measured.	Write contract with student.
2. The program is implemented; measurements are taken; but data are not recorded on graphs.	Implementor cites lack of time. Data are placed on recording forms instead of on graphs.	Manage implementor's class for a few mintues each day initially while he/she graphs data, and then gradually withdraw. Keep all graphs in a looseleaf notebook for easy access and record all data directly on graphs. Train others to record data.
	Implementor cites lack of charting skills	Teach charting skills. Model charting behavior by providing samples.
	Implementor appears disinterested in data or does not see importance of recording and graphing data.	(SERT and principal) prompt and reinforce data recording and graphing by "stopping by" to inspect graphs each day.
3. The initial program change is implemented; progress/performance is measured; data are recorded but additional changes are not made as planned.	Implementor states that the student is already making satisfactory progress.	Review discrepancy data and program plans with implementor and others involved in problem identification and program selection. Determine if all are satisfied. If not, write a contract to be signed by all concerned parties (including the implementor).
	Implementor believes program changes are unsettling to student.	Socially reinforce implementor for being concerned; arrange to review changes with student and/or suggest using the data to determine the effects of frequent changes.
	Implementor lacks skill in thinking of appropriate changes.	Consult with implementor. Organize several changes for implementor. Prompt and reinforce all efforts by implementor. Share simple "how to" articles appropriate to the problem.

Decision Rules for Making Program Changes ②

When a plan has been implemented and the data are collected and graphed, the data are used to determine when to make program changes. Based on the work of Bohannon (1975) and the rules for making data-based decisions discussed by Liberty (1972), we recommend the following two rules:

1. Make a change whenever three successive data points are plotted below the estimated progress/performance line.[1]
2. Make a change after plotting 15 data points or after three weeks, whichever comes first.

Each time a change is made, be sure to record the new discrepancy on the Discrepancy Ratio Worksheet.

Changing the Estimated Progress/Performance Line

When three successive data points are plotted below the estimated progress/performance line, necessitating a program change, a change is also required in the estimated progress/performance line. The new estimate is drawn parallel to the original line beginning at the last recorded data point (see Graphs 12e-1, f-1, g-1, in Part V).

The new estimate adjusts the original objective to the student's actual performance. When the initial estimate is computed, there is little information on which to evaluate the student's progress/performance on the specific objectives proposed. At best, the initial estimates are educated guesses that are based on the team's evaluation of the importance of the problem, the time available for the intervention, and the size of the discrepancy. In practice, when the estimate is consistently not achieved, it is a signal that the original estimate may be too high (or too low, if progress/performance is consistently and markedly above the estimate). The new estimate, therefore, is drawn to accommodate the actual performance of the student.

Overview of Evaluation

During this phase of program oeprationalization, the extent to which the program is being implemented as planned is evaluated.

The four questions which are answered are shown in the matrix. When discrepancies between the program plan and its implementation are detected, the differences are reconciled or justified through the review process.

DECISION AREA: Program Operationalization
PROGRAM PHASE: Implementation Evaluation
PROCESS: Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
10. Is program plan implemented as proposed?		
Are there a sufficient number of data points for each intervention?	Guidelines for reviewing data. ①	Review graphed data and compare with program plan.
Are program changes frequent enough?		Complete Part One of Case Report Summary Ten. ①
Are changes made according to decision rules?		

---

[1] After three changes have been made, the data for each change will be reviewed to evaluate which changes have been successful. These procedures are discussed in Part V.

① Guidelines for Reviewing Data

One of the best ways to determine if a program is being implemented as planned is to review the graphs which are being maintained for the program. The following data should be summarized on Case Report Summary Ten:

Data Required	Procedures for Review
1. Data relating to measurement	
a. Are there graphs for all pinpointed behaviors selected in the program plan?	There should be as many graphs as are listed in Case Report Summary Seven.
b. Is performance being measured?	Compare the program plan with the actual measurement data which are available.
c. Are data recorded on graphs.	Each graph should contain daily/weekly/monthly data points, depending upon the type of graph and agreed-upon measurement procedures in Case Report Summary Seven.
2. Data relating to change procedures	
a. Are the changes identified on the graphs?	Check the graphs for vertical change lines indicating that changes have been implemented
b. Have program changes been made according to the decision rules?	Count number and location of data points.
c. Are the changes those specified in the plan?	Compare program plan with implemented changes.

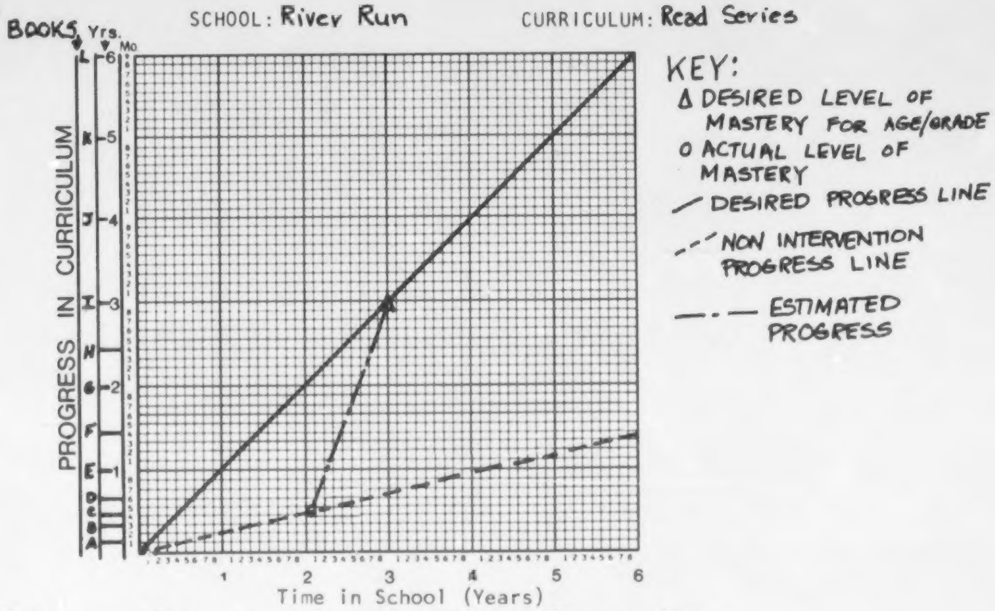
The frequency with which the formal reviews of program implementation occur depends entirely on the individual or group responsible for managing the program. We recommend the first review within two weeks of program implementation and, again three to four weeks later (when necessary). Subsequent reviews are discussed in Part V.

EXAMPLE

Two weeks after Ricky's program was implemented the SERT reviewed and summarized the data recorded on Graphs 12d, 12d-1, 15c, and 19c.

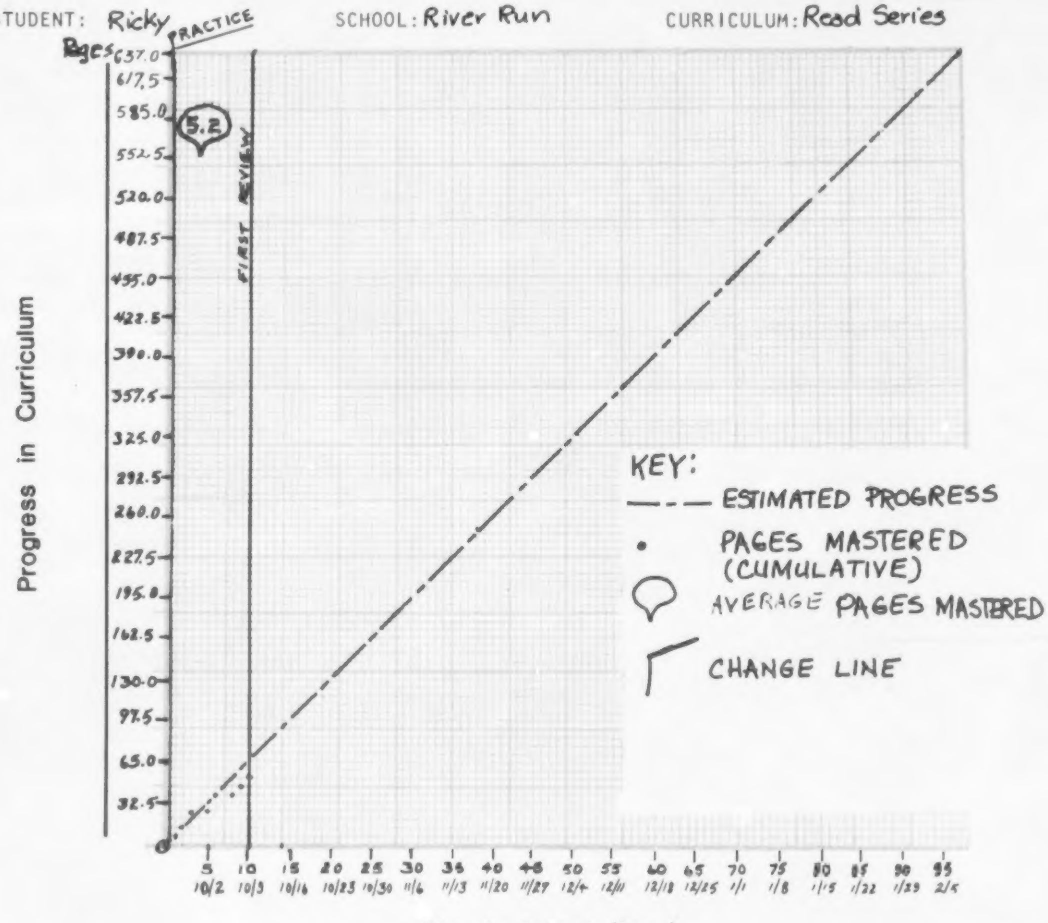
This information is summarized in Case Report Summary Ten.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series

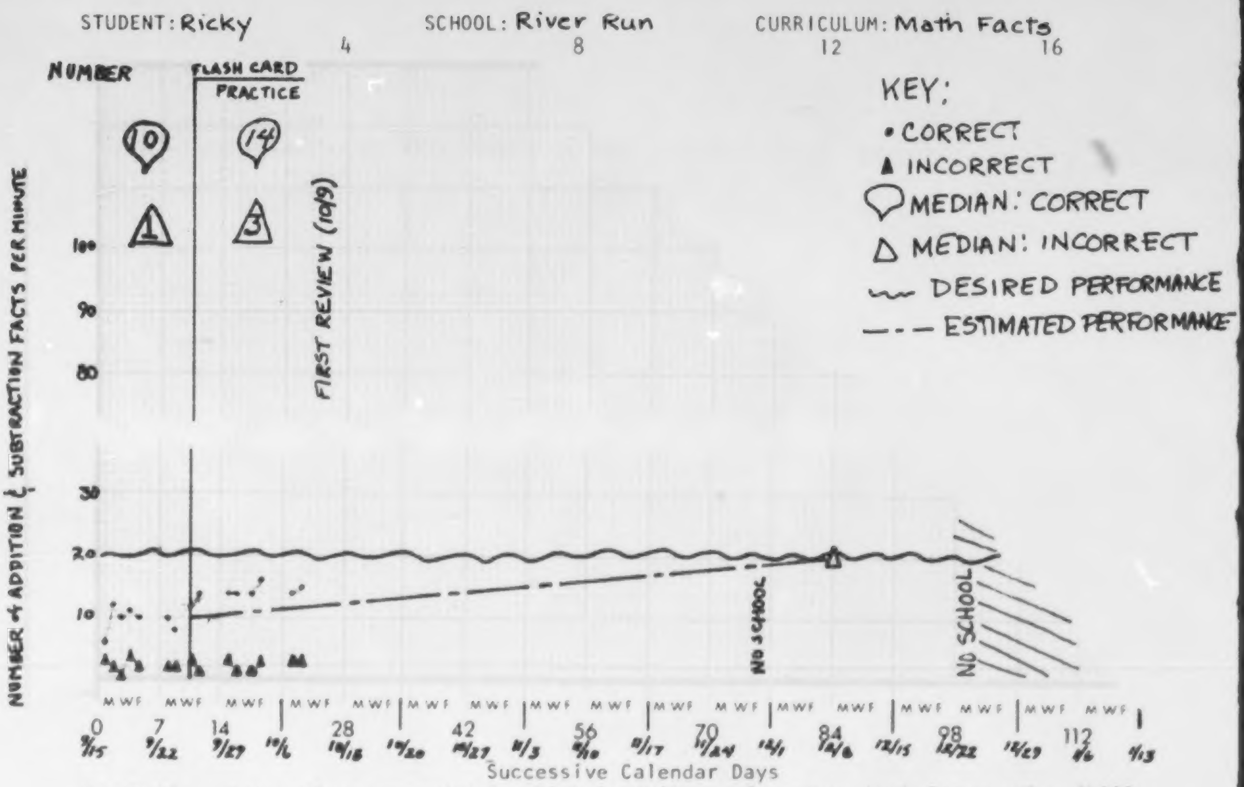


Graph 12d. Ricky's monthly progress graph, Read Series, first review.

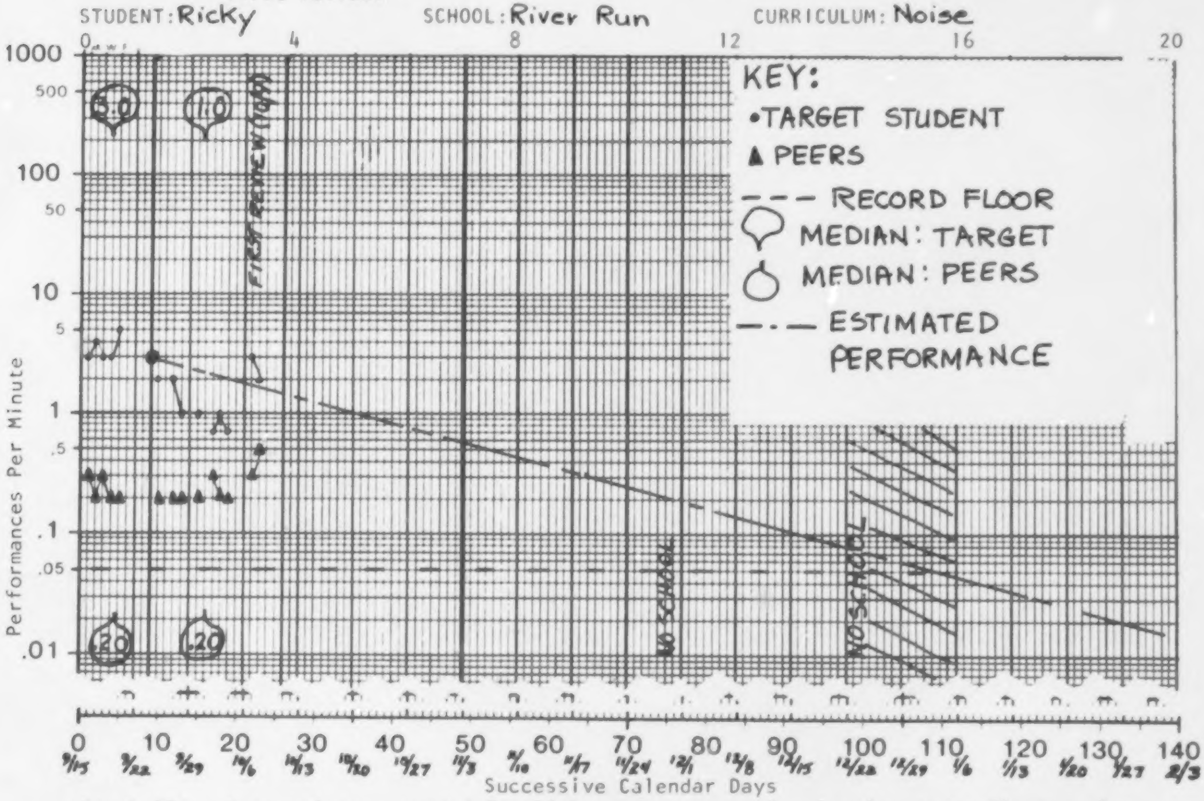
STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series



Graph 12d-1. Data points recorded for Ricky's daily progress in Read Series, at first review.



Graph 15c. Data points recorded for Ricky's daily performance, Math Computation Skills, first review.



Graph 19c. Data points recorded for Ricky and peers, noise in classroom, first review.

Overview of Communication and Collaboration

During the first six weeks of program operation several meetings are convened to evaluate whether the planned program is being implemented according to the agreements.

DECISION AREA: Program Operationalization
PROGRAM PHASE: Implementation Evaluation

PROCESS: Communication and Collaboration

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
11. Are all parties aware of the extent to which the program is being implemented?	Purpose of periodic review meeting. ①	
	Staffing Request Form. ②	Hold periodic review meetings with team. Reconcile any differences between program as planned and implemented. Complete Parts Two and Three of Case Report Summary Ten. ②

Purpose of Periodic Review ①

The primary mechanism for evaluating program operationalization is the periodic review. Periodic reviews are held throughout the student's program and should be established on a regular schedule. During implementation evaluation their focus should be on the agreements that were established in the orginal plan.

The implementation evaluation should occur from 1-2 weeks after the initiation of the program. The purpose of this first review meeting is to determine whether the plan is becoming operational (rather than effectively solving the problems); progress evaluation data need not be obtained. At this point, it is more important to know whether the data on performance are being collected rather than whether the data indicate the achievement of intermediate and long-term objectives. Subsequent review meetings focus not only on whether a plan is being implemented but, also, on whether data show any program effects (usually, changes in student performance). These reviews should be conducted as part of the periodic review of program plans conducted by the student support team and are discussed in Part V on progress evaluation.

Discrepancies between this plan and the actual operations of the program are discusssed by the team. Some discrepancies usually are resolved during the review; others are referred back to the program selection group or the SERT for resolution. All discrepancies between the planned and operational program are recorded on Case Report Summary Ten and filed for future reference. These records document the success of a program or provide the basis for the adoption of an alternative program when, as a result of periodic review, it becomes evident that the program plans have built-in problems that interfere with implementation.

EXAMPLE

At the team meeting at which Ricky's program was reviewed there was general agreement that the program was being implemented as planned. This information is summarized in Case Report Summary Ten.

EXAMPLE

The SERT included Ricky's name for periodic review on the staffing form routinely circulated to all team members 3-5 days prior to the staffing meeting. A sample of this form, which should be used for all staffings, follows:

② Staffing Request Form

To: Members of Student Support Team

From: SST Chairman[1]

Date: October 4, 1975

Here is a list of the students for whom requests have been received since our last meeting.

Lisa M. (Grade 5)

Daisy S. (Grade 3)

Consultation for Joey D. (Grade 2)

Please list students whose programs should be reviewed.

Implementation Evaluation	Progress Evaluation	Program Certification
Ricky J. (Grade 3)		
Sally E. (Grade 4)		

The SST will convene in the resource room at 7^{30} AM on October 9, 1975. Return this form to the SERT prior to the meeting.

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[1] We recommend that the SERT chair this team.

CASE REPORT SUMMARY TEN

Results of the SERT's program review are summarized here and circulated to all interested parties.

Ricky J.	3	9	Ms. B.
Student	Grade	Age	Teacher

III. PROGRAM OPERATIONALIZATION

9. Is program being implemented?
10. Is program being implemented as proposed?
11. Are all parties aware of the extent to which the program is being implemented as planned?

Summarize data from graphs here.

Date	10/8/75	
Number of Graphs	1 2 3 [✓ 4] 5 6	
Data Plotted?	[✓ YES/]	NO
Changes Made?	[✓ YES/]	NO
Are changes frequent enough?	[✓ YES/]	NO Comment

Summarize review meeting here.

Date 10/9/75
Program is being implemented as proposed.

List changes required to reduce discrepancy between program plan and program implementation

Date 10/9/75
None

References

Bohannon, R. Direct and daily measurement procedures in the identification and treatment of reading behaviors of children in special education. Unpublished doctoral dissertation, University of Washington, Seattle, 1975.

Liberty, K. Data decision rules. Unpublished working paper #20, Regional Resource Center, University of Oregon, Eugene, 1972.

Starlin, A. Sharing a message about curriculum with my teacher friends. In J. B. Jordan et al. (Eds.), *Let's try doing something else kind of thing.* Arlington, Va.: Council for Exceptional Children, 1972.

PART V

Developing Skills in DBPM: Interpretation, Refinement, and Adjustment

It is not so much a skill as a personal characteristic--an attitude. And that attitude is one of optimism. If you believe the principles of the behavioral approach, then an optimistic approach is the only one with which you can function. You believe that this child can learn and that you can arrange the environment to help him learn. You cannot indulge yourself in the luxury of saying, "He's too stupid," or "He must be brain damaged."
You naturally embrace an attitude of let's try doing something else kind of thing.

Sidney W. Bijou

(Let's Try Doing Something Else Kind of Thing, p. 11).

Overview

There are described in Part V the essential skills of the data-based approach which lead to cumulative improvement in programs.

As we have stated repeatedly, no one can predict with certainty the specific program changes that will eliminate an academic or social discrepancy; such changes can be identified only through the systematic testing of alternatives. In contrast to teaching as it is ordinarily conducted, DBPM is a continuous evaluation design in which programs are deliberately changed and the effects of each change are compared with the effects of previous program changes. Such comparisons enable objective decisions to be made about which change(s) is(are) leading most rapidly to problem solution and which is (are) least helpful. When programs incorporate the data-based procedures outlined here, they have an evolutionary quality, that is, successful changes survive and become a part of the program while unsuccessful changes fall out. The net result of such an approach is the construction of a program that is cumulative in its effect on problem resolution. Let us review the procedures that produce these cumulative benefits:

1. During problem selection, conduct an initial assessment of performance discrepancies to clarify what problems exist and to aid in determining priorities among problems. The data collected during initial assessment should establish a baseline against which subsequent program modifications can be tested. Continuity in programing is established as the data collected initially are the same data that are used in later program evaluation decisions.

2. During program planning, carefully develop a plan containing several alternative program changes that may lead to problem solution. Attempt to predict the relative cost and effects of different alternatives, and develop the attitude that what we try first may work, but if it does not we have other solutions to test.

3. During program implementation undertake implementation evaluation to insure that the program which was selected is actually in operation. Improvement of the program will require a data-based decision about the extent to which the program modification has had good effects on the performance discrepancies. For that reason, care must be taken to insure that the time series data collected during initial assessment are also recorded and graphed when the program plan is implemented.

4. Change some aspect of the program after 15 data points have been plotted or 3 weeks, whichever comes first, or after 3 successive points have been plotted below the estimated progress/performance line.

Progress evaluation adds two additional steps to the process:

5. After a maximum of three changes have been made, compare the data obtained prior to each program change with the data obtained after each program change to determine whether a clear change in level or direction has resulted.

6. Maintain those changes which have resulted in program improvement and drop those which have not led to improvement.

Adherence to this routine leads to continuous program improvement, and the improvement is reflected in the graphed data. We cannot guarantee that each program change will be successful, but we can guarantee that you will know when a change produces demonstrable success. Further, we can say with some assurance that, in the long run, you will be more successful in solving the problems for which you are responsible than you would be if you did not use the procedures outlined. In Chapter IX, these procedures are described in some detail.

Chapter IX

USING DATA TO MAKE PROGRAM IMPROVEMENTS

DECISION AREA:
Program Adjustment

PROGRAM PHASE:
Progress Evaluation

Contents

Measurement
Evaluation
  1. Achieving Behavior Goals
  2. Implementing New Program Plans
Communication and Collaboration

PROCESS: Measurement

DECISION AREA: Program Adjustment
PROGRAM PHASE: Progress Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
13. What information is available on cumulative progress/performance to date?	Guidelines for obtaining change data. ①	
What is median level of progress/performance for each program change?	Procedures to compute medians. ②	Compute medians for each program change. ②
What is the discrepancy for each program change?	Procedures to compute discrepancy ratios. ③	Compute discrepancy ratios. ③
What is the change in the discrepancy ratio from initial assessment?	Procedures to compute change in discrepancy ratios. ④	Compute change in discrepancy ratios. ④
What is the direction (trend) of the data for each program change?	Procedures to draw trend of data for each change. ⑤	Draw trend lines. ⑤
What variability is there in performance for each change?	Procedures to determine variability and step changes. ⑥	Summarize variability and step change data. ⑥
Is there a step (up or down) at the point of change?		Complete Part One of Case Report Summary Eleven.

① Guidelines for Obtaining Program Change Data

In describing data-based decision making during program operationalization, we recommended that planned program changes be made (a) whenever the student's behavior fell below the estimated progress/performance line for 3 successive data points and (b) after 3 weeks or 15 data points, depending on which comes first. This decision rule is a useful one to follow to determine when a program change is in order.

Another useful rule is to make a careful analysis of the effects of the changes on the problems that led to the initial referral after a maximum of every three program changes. At regular intervals, these analyses are communicated to the team during the periodic reviews. The following steps should be followed in the analysis.

STEP 1 *Determine the general level (median) of the behavior during each program change.* ②

STEP 2 *Compute the discrepancy ratio for each change.* ③

STEP 3 *Compare the discrepancy ratio for the last recorded change with the discrepancy during initial assessment and compute the change in the discrepancy ratios.* ④

STEP 4 *Draw a trend line to show the direction of the behavior for each change and compute its value.* ⑤

STEP 5 *Determine whether the direction of this change is leading to a reduction in the discrepancy.* ⑥

STEP 6 *Estimate changes in variability and step, that is, whether there is an immediate change in the level of the performance/progress data after a program change.* ⑥

The procedures for obtaining the information specified in steps 1-6 are as follows:

② Procedures to Compute Change in General Level (Medians)

The procedures for identifying medians are detailed in Chapter III. When the data points for each program change are ordered from low to high, the middle number is the median; if the number of points is even, the number half-way between the two middle points is the median.

EXAMPLE

The SERT computed the medians for the data collected in Ricky's program and marked them on the graphs. (See Graphs 12d-1, 15c, and 19c; see pp. 157-158.)

③ Procedures to Compute Discrepancy Ratios

To compute the discrepancy ratio, as described in Chapter III, determine desired progress/performance level and actual progress/performance level, and divide the larger number by the smaller number. Enter the data on the Discrepancy Ratio Worksheet.

EXAMPLE

The SERT computed discrepancy ratios for Ricky and summarized them on the Discrepancy Ratio Worksheet.

Procedures to Compute Change in Discrepancy Over Initial Assessment ④

The data-based approach affords the opportunity to objectively describe the degree to which a problem has been solved by a particular program change. Suppose we wanted to compare the effects of three different program changes in which the desired performance objective is as follows:

When presented with the 80 vocabulary words from Level 6, the student will identify 95% of the words correctly.

Suppose the data in Table IX-1 appeared on the Discrepancy Ratio Worksheet. The table summarizes the discrepancy after each phase of program modification and the degree of improvement from the beginning (initial assessment) to the last program modification (Change 3). The general level of performance during each program modification is presented (i.e., the medians of actual performance level), and the degree to which actual performance differs from desired performance (discrepancy ratio) is summarized for each change across the bottom. The discrepancy is quantified by dividing the larger number (desired performance level--95%) by the smaller number (medians of actual performance levels) and the result is expressed in terms of "times" by adding the multiple (1.20X, 1.01X, etc.). The desired performance during initial assessment was 2.4X greater than the actual performance. After the first program modification (Change 1), the discrepancy decreased to 1.2X, and during the last program modification the discrepancy was reduced to a difference of 1X (i.e., no difference at all).

What is new here is that the table also includes a summary of the degree to which the discrepancy was changed from initial assessment to Change 3. To determine the change in discrepancy from initial assessment to the end of (or at any point in) the program, one simply divides the larger discrepancy by the smaller and indicates whether the discrepancy is larger or smaller than it was initially. The general formula is as follows:

$$\frac{\textit{larger discrepancy}}{\textit{smaller discrepancy}} = \textit{change from initial assessment (X)}$$

This same formula is applied whenever any discrepancy is computed and may be used, therefore, to summarize discrepancies for either rate of progress or performance.

Procedures to Compute Change in Direction (Trend) ⑤

A. Drawing Trend Lines.

STEP 1 *Split the data for each program change phase in half.*

STEP 2 *Find the median data points for each half.*

Table IX-1

Discrepancy Ratio Data for a Program Objective

	Initial Assessment	Change 1	Change 2	Change 3	Change from Initial Asses.
Desired Level	95%	95%	95%	95%	X1.0 no change
Actual Level	40%	79%	94%	95%	X2.4 increase
Discrepancy Ratio	2.40X	1.20X	1.01X	1.00X	X2.4 smaller

STEP 3 *Plot the median data points for each half on the lines that represent the middle day for each half (two points will be plotted on two different lines).*

STEP 4 *Connect the median data points with a straight line and extend the line to the beginning and end of the phase period.*

B. Computing the Value of Trend Lines.

STEP 1 *Note the point at which the trend line crosses two successive Monday lines (extend lines if necessary).*

STEP 2 *Determine the level (frequency) of the behavior on those days.*

STEP 3 *If you are using equal interval graph paper, subtract the smaller level (number) from the larger and give the result a (+) if trend is increasing or a (−) if it is decreasing.*

EXAMPLE

The SERT drew trend lines for all the graphs, except the yearly progress graph, maintained for Ricky. (Short-term trends tend to be meaningless on yearly progress graphs.) The directions of the trend lines are summarized in Case Report Summary Eleven.

⑥ Procedures to Determine Variability; Immediate Change in Level (Step) at the Point of Intervention

Variability and immediate change in level (step up or down) at the point of program change are determined by "eye-balling" the data. A change in which data points are scattered throughout the period of intervention indicates variable performance. A large change in level between the last recorded data point of one phase and the first data point of the next phase indicates a step (up or down) at the point of intervention.

Evaluation

PROCESS: Evaluation

DECISION AREA: Program Adjustment
PROGRAM PHASE: Progress Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
14. Is the program as implemented producing cumulative benefits for the student?		
Are there positive data trends? Are there positive changes in discrepancy ratios over initial assessment? Were some program changes more effective than others?	Practice in interpreting graphed data. ①	Evaluate summarized program change data on discrepancy ratio worksheet and graphs. Complete Part Two of Case Report Summary Eleven. ①
Will programs for other behaviors identified as high priority during initial assessment be implemented at this time?		Develop objectives and graphs for each new behavior. Select program changes for each objective. Draw projected progress/performance estimates on graphs. Circulate form to receive feedback. (See Chapter VII.) ②

Practice in Interpreting Graphed Data ①

In Figure IX-1, 10 graphs are presented, each different in some important way. Each graph is set up so that (a) the vertical axis represents the level of behavior, (b) the horizontal axis represents time (days, weeks, months), (c) the numbers represent the general level or central tendency (median) of the behavior before and after the program change (e.g., in graph a, the general level prior to change was 25 behaviors per day; after the change, the general level was 75 behaviors per day), and (d) a vertical line representing the point at which the program change occurred.

The basic question to be answered in each graph is, "Did the change in program influence the behavior?" To answer the question, we must determine whether student behavior after the program change displays any of the following differences:

1. Change in General Level: Is the general (median) level of behavior different after the change from what it was before the change? (Graphs a, b, f, h, i, and maybe j.)

2. Change in Direction: Does the trend of the behavior before the change differ from the trend after the change? For example, if the behavior was increasing prior to the change, did the rate of increase change or remain the same? (Graphs c, d, and maybe g, h, i, and j. Graph a is a change in level, not direction.)

3. Immediate changes in level of behavior at point of program change ("steps"): Is the level of the behavior immediately after the change in program clearly different from the level of the behavior immediately before the program change? (Graphs a, c, d, and g.)

4. Change in variability: Is there more daily up and down movement (variation) in the behavior before or after the change in program? (Graph e.)

Interpreting the behavioral effects of a change in program requires examination of graphed data in terms of the four possible kinds of changes (i.e., general level, direction, immediate changes in level, and variability) before drawing a conclusion. In the graphs presented in Figure IX-1, we feel most comfortable in concluding that a lasting change is reflected in cases a, c,

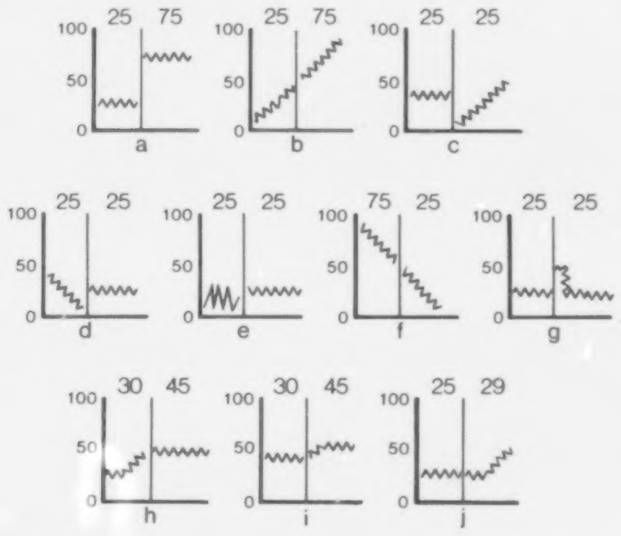


Fig. IX-1. Ten graphs depicting data collected before and after a program change.

d, and e; temporary change in g; and no change in b and f. We are uncertain about whether changing the program produced behavior changes in cases h, i, and j.

Learning to interpret graphs is like learning any new concept. You must repeatedly practice on many variations with some assistance and feedback until you become proficient. One thing is sure, correct interpretation requires the examination of each graph in terms of all the different kinds of changes that can occur, not one alone. Graphs b and f, for example, clearly illustrate the hazards of using change in general level without regard for the direction (trend) of the pre and post data. The general levels of performance before and after the program change clearly differ, in both cases, and when direction as well as level is considered it is evident that the program change had no effect at all on performance. The value of time series data is that they allow us to consider direction as well as level. Pre- and posttesting (e.g., looking at the behavior on the first and last days only) permit us to consider change in level but not direction, variability, or step.

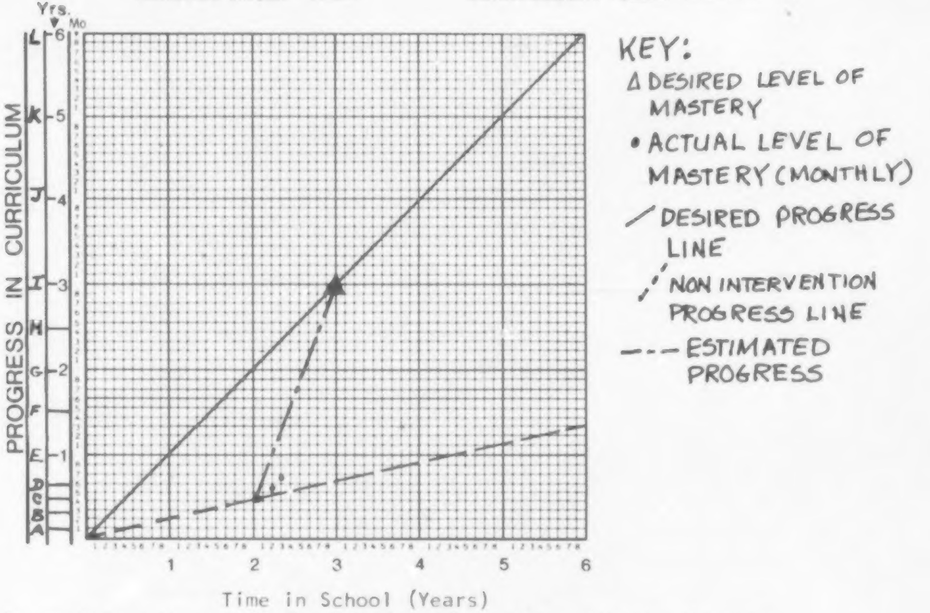
EXAMPLE

The following graphs, 12e, 12e-1, 15d, and 19d show data plotted by the SERT for Ricky during the first three changes of each program modification (reading progress, math facts, noise). Note that the level of the data is shown on the graphs for each program modification. Levels are presented in the tear drops and direction is shown as a straight line running in the direction of the data. In addition, note that each time a new change was implemented, a vertical line was drawn halfway between the lines on which the data point for the last change was plotted and the first data point for the next change was plotted. In the margin above the change a note was made identifying the modification(s) in Ricky's program that occurred at that point.

Let us look at each of Ricky's graphs. First inspect Ricky's math computation graph (15d). As you can see his level of performance was 10 correct and 1 incorrect per minute during initial assessment, and the direction of his performance was unchanging. The first modification in his math program consisted of daily flashcard practice on facts with the SERT. Was this modification a program improvement? Ricky's correct rate increased from 10 to 14 per minute, but his error rate also increased. His accuracy actually decreased! Daily flashcard practice resulted in Ricky's doing problems faster but less accurately. Further, all the performance change occurred in the first two days of flashcard practice; after 12 days he was performing virtually the same as at the beginning of flashcard practice.

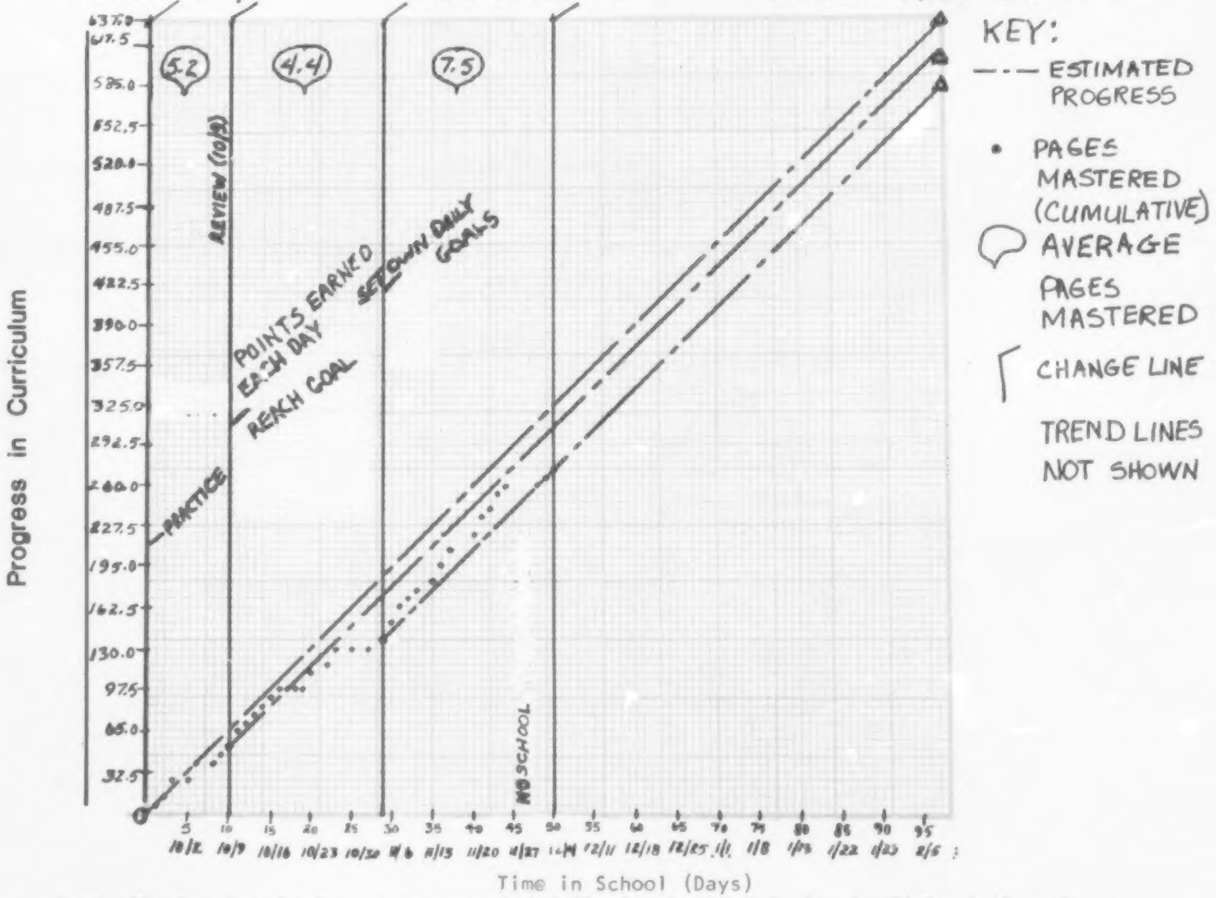
At this point, the SERT modified Ricky's program again by introducing 10 minutes of written practice on a math facts work sheet. Was the written practice modification a program improvement? Clearly, it was. Ricky's level moved to 22 correct and 2 incorrect problems per minute. In addition, his performance improved steadily for the first five days and then began to level off. The written practice modification produced an increase in speed, accuracy, and direction. Because Ricky's improvement began to level off and 15 data points had been recorded, even though Ricky had achieved desired performance level the SERT implemented a point system to reinforce Ricky for further improvement. Was the point system an improvement? We would say no because the direction of the data remained the same; but even more important, error rate increased to 6 per minute or 3X greater than during the practice phase. Since three changes had been made, the SERT computed the discrepancy ratio change. The actual performance level for correct facts/minute had changed from 10/min. to 22/min., a 2.2X change! The error rate had increased from 1/min. to 6/min. or

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series

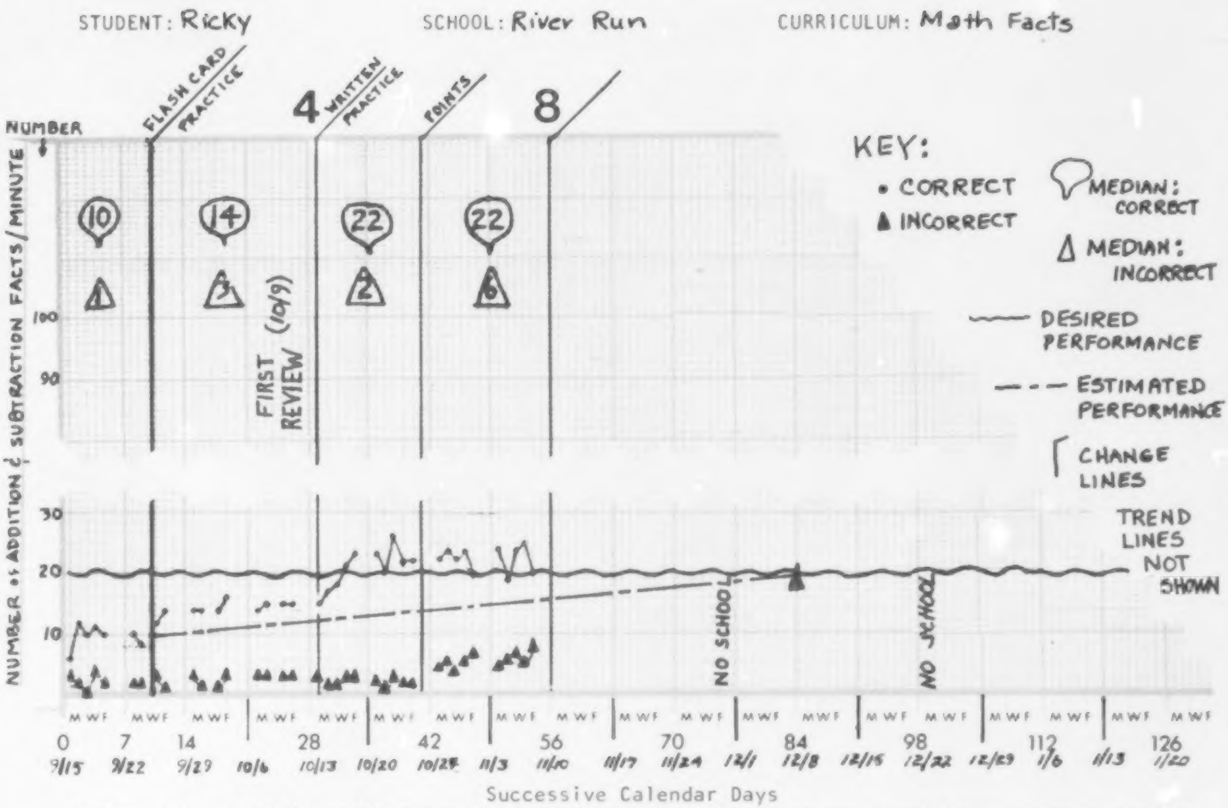


Graph 12e. Ricky's monthly progress in Read Series after three program changes.

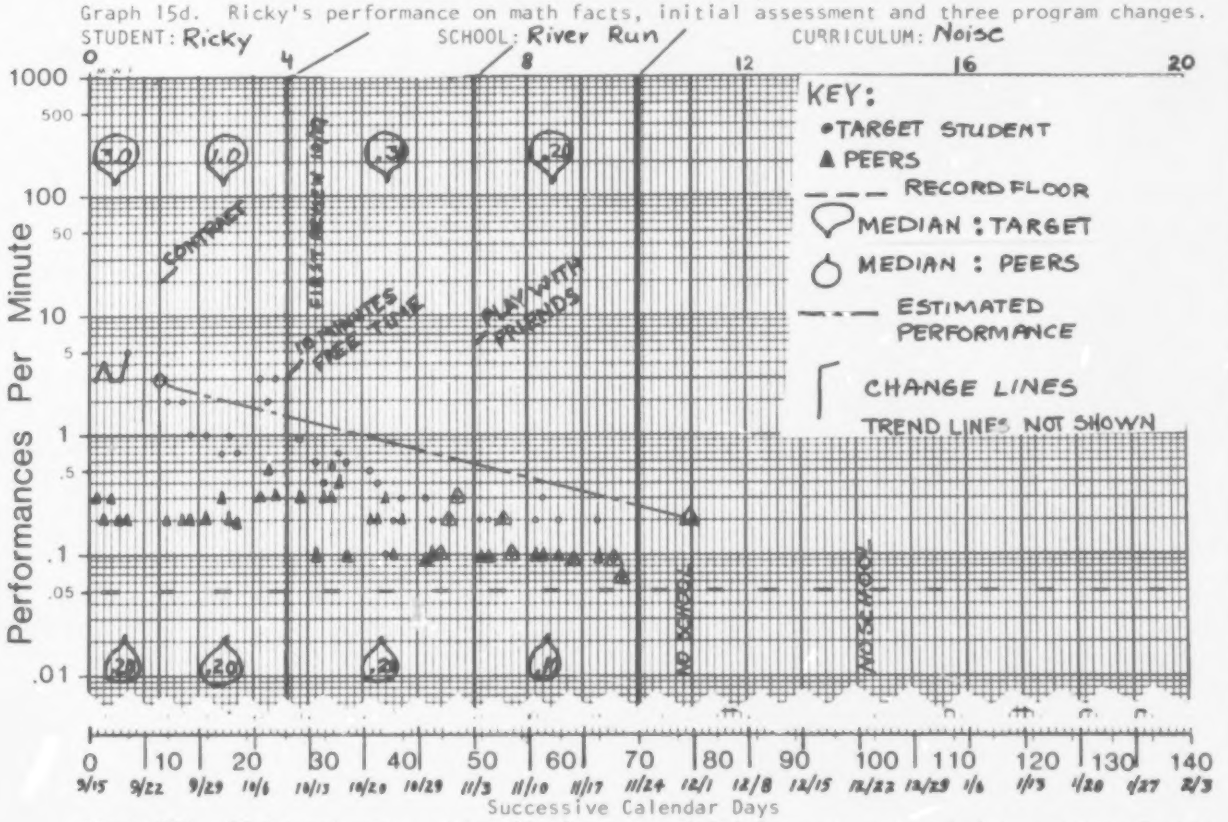
STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series



Graph 12e-1. Cumulative pages mastered daily in the Read Series by Ricky during three program changes.



Graph 15d. Ricky's performance on math facts, initial assessment and three program changes.



Graph 19d. Ricky and peers, noise in classroom, initial assessment and three program changes.

a 6X increase! Since Ricky was now writing answers to math facts at a rate which was faster than the desired level, the SERT decided to reassess peer performance on this task. A random sample of average students was asked to write answers to math facts. Their median rate was now 30/min. with 1 error. Recomputing the discrepancy it was evident that Ricky was still 1.4X slower than his peers. In addition his error rate was 6X greater. What would you do if you were Ricky's SERT?

Shift your attention now to Ricky's daily progress reading graph (12e-1). This graph depicts Ricky's daily progress through the Read Series. Because it is a cumulative graph the direction of the data will always be upward or level (no progress) rather than downward. Averages on this graph represent the number of pages mastered per day during the program change. The SERT has also drawn a projected progress line on the graph (the dashed diagonal line). That line is the rate of mastery which she would like Ricky to attain throughout program modification. The shorter unbroken lines running through the data points for each change represent the direction (trend) of Ricky's performance during the modifications. To use direction as an item of information for program improvement on a cumulative graph, you must compare the slopes of the trend lines for steepness.

Which of the modifications in Ricky's reading program were improvements? Introducing daily oral reading practice (the first modification) appears to have been an improvement; however, the eight days of data are insufficient to safely make this judgment. The three data points below the estimated line have resulted in a decrease in the direction of the data points. Introducing points for improvement (the second modification) resulted in a decrease in Ricky's average level of mastery over the first modification. The third modification, in which Ricky set his own goals, clearly affected Ricky's performance. There is a large increase in level of performance as well as in direction! Involving Ricky in making decisions about his own program resulted in large gains. Clearly, this change should be retained. The discrepancy is 1.4X smaller than during initial assessment!

In Graph 19d; noise made by Ricky and his peers, we can see that during initial assessment Ricky was more than 15X noisier than the peers. During the first change the discrepancy had decreased to 5X, but the trend of the data increased (undesirable in this case). During change two the data points for both Ricky and peers are below the estimated line. The trend of the data is decreasing which, in this case, is exactly what is desired! Change three produced the same results. What decision should be made regarding the effectiveness of the program changes? Is it clear which change had the greatest effect on the behavior? In this case, the positive gains appear to be based on the cumulative effect of all the changes. Does the program need to be continued? This is a decision the SERT will have to make. Perhaps other aspects of social behavior should be reevaluated and new program modifications developed? What action would you take?

The important point is that program improvement results from this type of progress evaluation. Each time a maximum of three changes are made in any program, the graphed data are evaluated in this way. Program decisions result from this analysis.

Developing Additional Objectives, Graphs, Changes: Progress/Performance Estimates for New Programs ②

Whenever a pupil's behavior is being modified to the satisfaction of the teacher, SERT, and other team members, the time has come to think of changing other behaviors. Here are some guidelines which may be helpful in deciding whether new programs should be implemented:

1. Persons responsible for Ricky's education express new concern about specific behaviors which were identified during initial assessment.

2. The discrepancies for the present program(s) have been completely reduced. Hence, the program(s) can be terminated, which makes time available to begin a new program.

3. The trend of the data for the present program(s) is increasing and there is a strong indication that the program(s) will be terminated soon. If time can be made available, another program can be started.

EXAMPLE

The first new program, progress in the math skill sequence, was implemented for Ricky on December 8. Recall that when the SERT reviewed Ricky's program for computing math facts on November 11 she found that although the discrepancy in writing answers to math facts had decreased, Ricky's error rate had increased 6X (from 1 error/min. to 6 errors/min.). A change was implemented specifically to decrease error rate. After three weeks, the error rate had decreased to one and the trend of math facts correct was increasing again. Upon reassessment, the SERT decided to begin a program in mastery of math objectives (see Graphs 14c and 14c-1).

The following objectives and change procedures were written on Case Report Summary Six.:

Math Sequence	CONDITIONS	BEHAVIOR	CRITERIA
Long Range Behavior	By the end of the year when given three sample sets of problems from skills 13, 14, 15, 16, 19, & 21-37	Ricky will write answers to these problems	At a median rate of 20 digits correct/min. or better.
Daily or Weekly Behavior	Each week when given a sample of problems from the present skill and previously mastered skills	Ricky will write answers to these problems	At the criteria specified Above.

Change 1 Direct instruction 10-10:30 daily in classroom by SERT.

Change 2 Point system- (25 for each skill mastered; 200= trip to antique auto museum with family)

Change 3 Contract with peer tutor.

The following measurement procedures were specified on Case Report Summary Eight:

Behavior to be Measured	How materials are organized	What the teacher says	What the student does	Type of graph	Frequency of Measurement	What is recorded on the graph
Math Skills	Printed page of problems selected equally from present and all previous objectives.	Please write the answers to these problems.	Writes answers for 1 minute.	[✓ Progress] Performance	Daily [✓ Weekly] [✓ Monthly]	Cumulative skills mastered.

A second new program was implemented for Ricky for spelling on December 8 as well. This program was developed in response to Ricky's teacher's concerns regarding spelling. Reassessment of Ricky's spelling performance and that of average peers in his class revealed the following:

Ricky: Median of 22 letters written correctly per minute in sequence.

Peers: Median of 35 letters written correctly per minute in sequence.

The new discrepancy was therefore 1.6X less, a change which was 1.2X smaller than the initial assessment but still large enough to be of concern. (See Graph 16b.)

The following objectives and change procedures were written on Case Report Summary Six:

	CONDITIONS	BEHAVIOR	CRITERIA
Spelling Long Range Behavior	By the end of the school year when dictated three paragraphs from the Read Series	Ricky will spell the words dictated	At a median rate of 35 correct letters/minute in sequence.
Daily or Weekly Behavior	Each week	Ricky will spell the words dictated	At a median correct rate which is .5 letters/min. better than the previous week.

Change 1 10 minutes daily practice

Change 2 Peer tutor

Change 3 Set own daily goals.

The following measurement procedures were specified on Case Report Summary Eight.

Behavior to be Measured	How materials are organized	What the teacher says	What the student does	Type of graph	Frequency of Measurement	What is recorded on the graph
Spelling	Paragraphs selected by teacher from Ricky's current reading book.	Please write as many words as you can as I dictate them to you.	Student writes words for 1 min.	Progress [✓ Performance]	[✓ Daily] Weekly Monthly	# of letters written correctly/incorrectly in sequence.

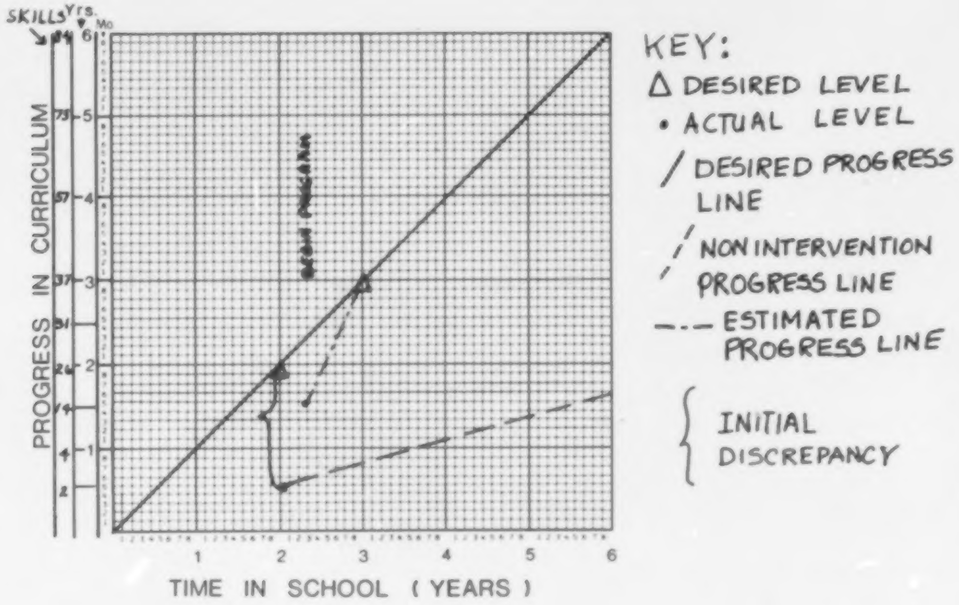
At this time the SERT also reassessed the off-task behavior of Ricky and peers. The data collected were as follows:

Ricky: Median off-task behavior/minute .3

Peers: Median off-task behavior/minute .4

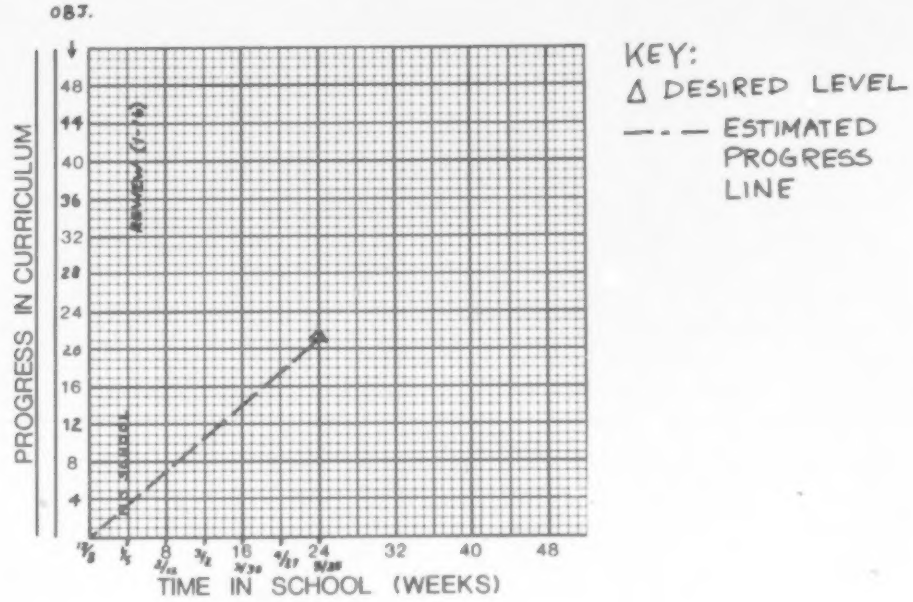
The new discrepancy was therefore 1.3X less off-task behavior for Ricky than for peers. The discrepancy no longer existed. When actual level is greater than (or less than for a decreasing behavior) desired level the discrepancy is treated as 1.0X (no discrepancy) when computing change from initial assessment. (See Graph 18b.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Math Sequence

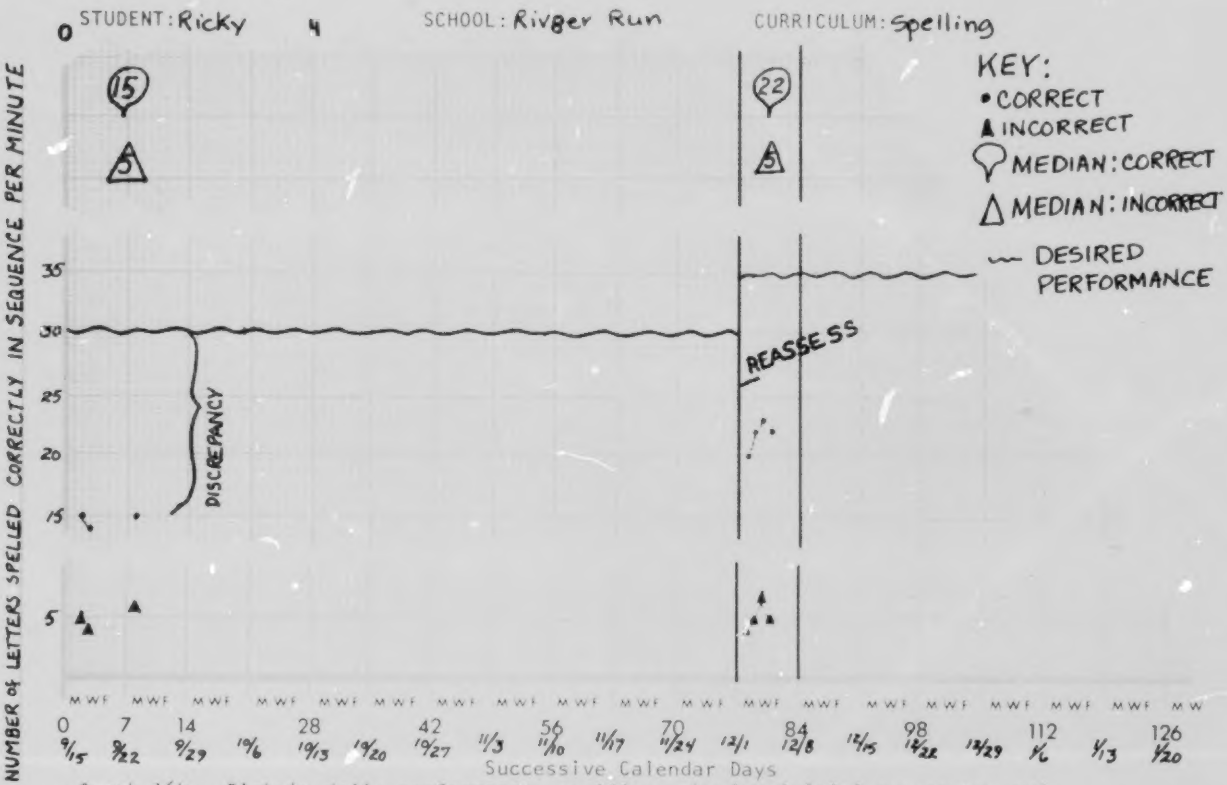


Graph 14c. Ricky's monthly progress graph, math sequence, showing initial assessment reassessment data and estimated progress line for intervention.

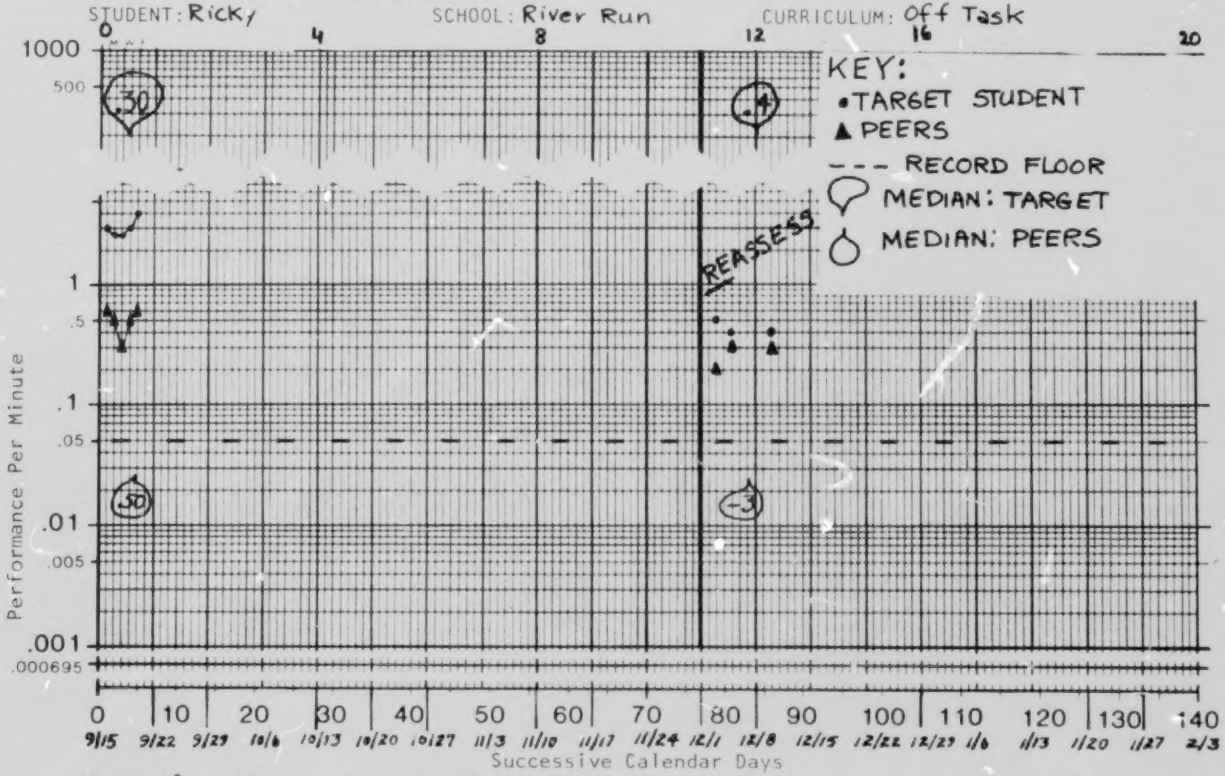
STUDENT: Ricky SCHOOL: River Run CURRICULUM: Math Sequence



Graph 14c-1. Ricky's weekly progress graph, math sequence, with estimated progress line.



Graph 16b. Ricky's daily performance, spelling, showing initial assessment and reassessment data.



Graph 18b. Ricky and peers' off-task behavior in classroom, showing initial assessment and reassessment data.

DISCREPANCY RATIO WORKSHEET[a]

Student Ricky School River Run Teacher Ms. B

BEHAVIOR 9/25 11/1 12/1

Reading	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.	20.0	21.0		1.2x								
ACTUAL LEVEL	9 mos.	5.5	6.5		1.6x								
DISCREPANCY	4.5 x	3.6x	3.2x		1.4 x smaller								

less less less

BEHAVIOR 9/25 11/1 12/1 (Reassess)

Math Sq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.	No	21.0		1.2X								
ACTUAL LEVEL	5 mos.	Data	19.0		2.8X								
DISCREPANCY	3.7 X		1.4x		2.6X smaller								

less less

BEHAVIOR 9/25 10/14 10/25 11/8

Math Facts	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	20/min.	20	20	30	1.5x								
ACTUAL LEVEL	10/min.	14	22	22	2.2x								
DISCREPANCY	2.0 x	1.4x	1.1x	1.4x	1.4x smaller								

less less more less

BEHAVIOR 9/25 11/1 12/1

Phonics Sq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.	No	No										
ACTUAL LEVEL	9 mos.	Data	Data										
DISCREPANCY	2.0x												

less

BEHAVIOR 9/25 12/5 (Reassess)

Spelling	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	30/min.	35			1.2X								
ACTUAL LEVEL	15/min.	22			1.5X								
DISCREPANCY	2.0 X	1.6X			1.2X smaller								

less less

BEHAVIOR 9/25

Handwriting	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	15/min.	No	No										
ACTUAL LEVEL	36/min.	Data	Data										
DISCREPANCY	1.2 x												

less

BEHAVIOR 9/25 10/10 11/1 11/22

Noise	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	.20/min	.20	.20	.10	2.0X								
ACTUAL LEVEL	3.0/min.	1.0	.30	.20	15.0 X								
DISCREPANCY	15 x	5x	1.5x	2.0x	7.5 X Smaller								

more more more more

BEHAVIOR 9/25 12/10

Off Task	Init. Assess.	Change	Change	Change
DESIRED LEVEL	.50/min		.90	
ACTUAL LEVEL	3.0/min		.30	
DISCREPANCY	6.0 x more		1.3x more	

---

[a] Included here are the monthly progress data for reading, medians for each program change for the math facts and noise programs and the reassessment data for progress in the math sequence, spelling and off-task behavior.

PROCESS: Communication and Collaboration

DECISION AREA: Program Adjustment
PROGRAM PHASE: Progress Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
15. Can information gathered on program changes be useful to others?	Purpose of periodic review meetings. ①	
Are all interested parties informed of progress?	Staffing Request Form. ②	Hold periodic review meeting with team, parent, student.
Are there recommendations for program adjustments?		Share data on student progress/performance with team, parent, student. Discuss recommendations for further program improvement. Complete Case Report Summary Eleven. ② Continue program as recommended. Repeat review process at regular intervals.

Purpose of Periodic Review Meetings ①

Program improvement is based on data evaluation made by the SERT after each of three program changes. At regular intervals, the results of the evaluations described in the previous section are shared with team members, parents, and the student. This communication with the persons who are concerned provides feedback on those aspects of the program which are successful and those changes which have not led to program improvement. When shared, the information frequently results in the adaptation of the successful changes to behaviors which are not part of the initial program modification plan. In addition, the review provides the opportunity for program accountability.

Prior to the periodic review, the SERT reviews the data which have been collected and summarizes data on general trends, levels, and variability for all program changes. In addition, the most effective changes are identified. Recommendations for program adjustments that need team approval are also summarized. If new program modifications are recommended, objectives, change plans, and graphs are also completed as they were previously (see section on evaluation).

EXAMPLE

The SERT summarized the relevant data for Ricky on Case Report Summary Eleven for the time period September 27, 1975 (implementation of the program) to January 15, 1976 (periodic review), based on data shown in Graphs 12f, 14d, 14d-1, 12f-1, 15e, 19e, and 16c (see pp. 181-85). At this time 5 changes had been made in Ricky's reading program, one change had been implemented in the spelling program and no change had been made in the math skills program. The change which was implemented in the math facts program related to instruction in the math skill sequence.

In social behavior, the program to reduce noise in the classroom had also been completed satisfactorily. The SERT had reassessed Ricky's off-task behavior and found that the discrepancy was now completely reduced. Ricky was 1.3X less off task than his peers!

Data on these programs were summarized on the Discrepancy Ratio Worksheet and Case Report Summary Eleven and subsequently reported to the team, Ricky, and his parents.

At subsequent reviews, the same procedures will be followed. This means that for each student, several copies of Case Report Summary Eleven may be filed during any school year.

EXAMPLE

The SERT included Ricky's name for periodic review on the staffing form routinely circulated to all team members three to five days prior to the meeting. A sample of this form follows. The results of the staffing are summarized in Case Report Summary Eleven.

② Staffing Request Form

This form is used to convene all staffings.

To: Members of Student Support Team

From: SST Chairman[a]

January 10, 1976
Date

Here is a list of the students for whom referrals have been received since our last meeting.

Barry R. (Grade 3)
Harvey B. (Grade 6)
Joan L. (Grade 1)

Ms. T wants help with Timmy.

Please list students whose programs should be reviewed.

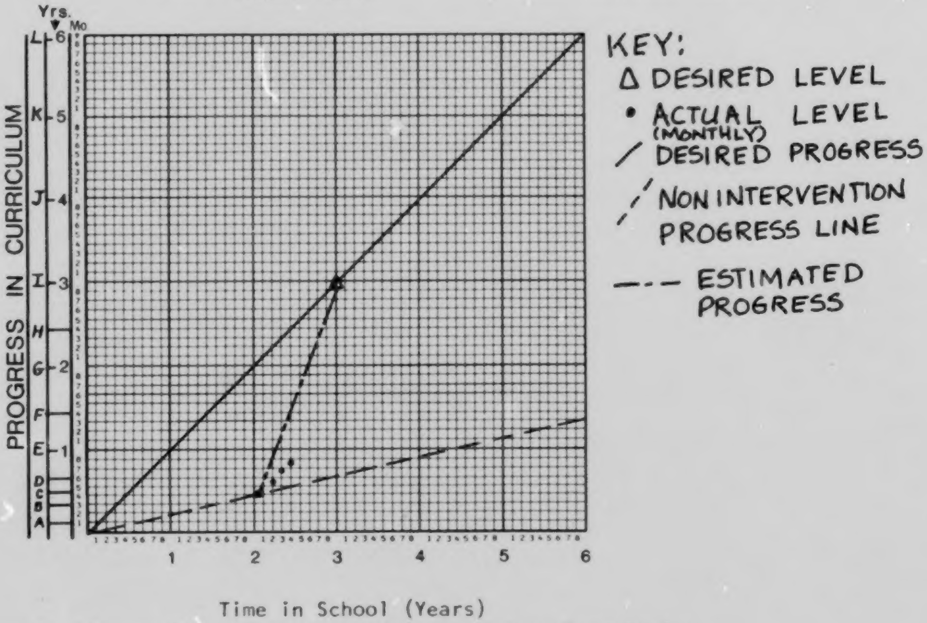
Implementation Evaluation	Progress Evaluation	Program Certification
SALLY (Grade 5)	Ricky (Grade 3)	Paul (Grade 6)
Tom (Grade 4)		
Pat (Grade 2)		

The SST will convene in the resource room at 7 30 A.M. on January 16, 1976. Return this form to the SERT prior to the meeting.

---

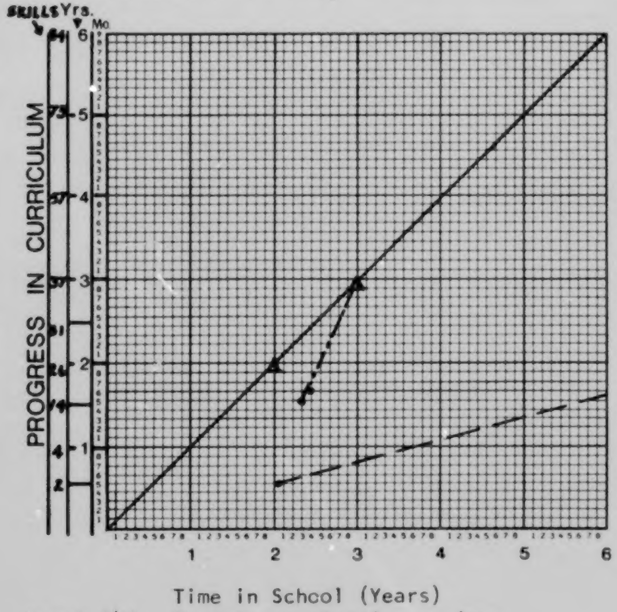
[a] We recommend that the SERT chair this team.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: READ SERIES



Graph 12f. Progress evaluation review: Ricky's monthly progress, Read Series.

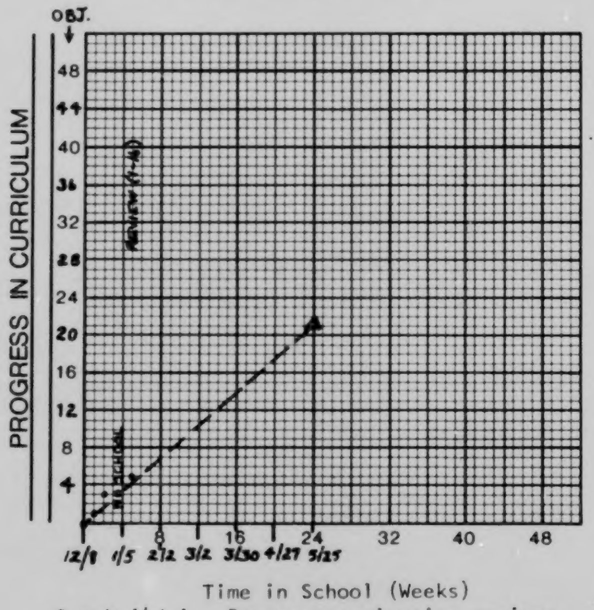
STUDENT: Ricky
SCHOOL: River Run
CURRICULUM: Math Sequence



Graph 14d. Progress evaluation review: Ricky's monthly progress, math sequence.

KEY: Δ DESIRED LEVEL
• ACTUAL LEVEL (MONTHLY)
/ DESIRED PROGRESS
/ NON INTERVENTION PROGRESS LINE
--- ESTIMATED PROGRESS

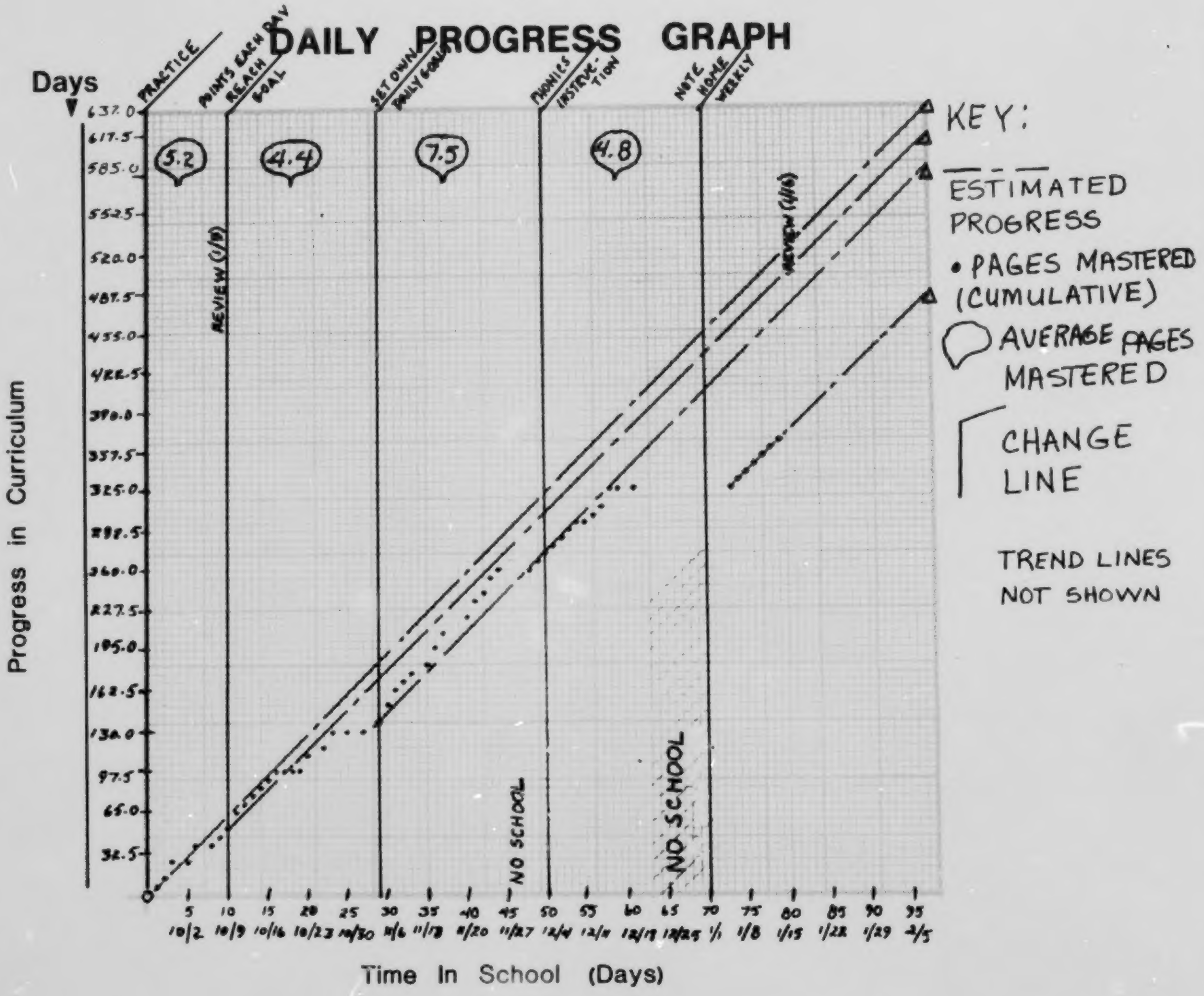
STUDENT: Ricky
SCHOOL: River Run
CURRICULUM: Math Sequence



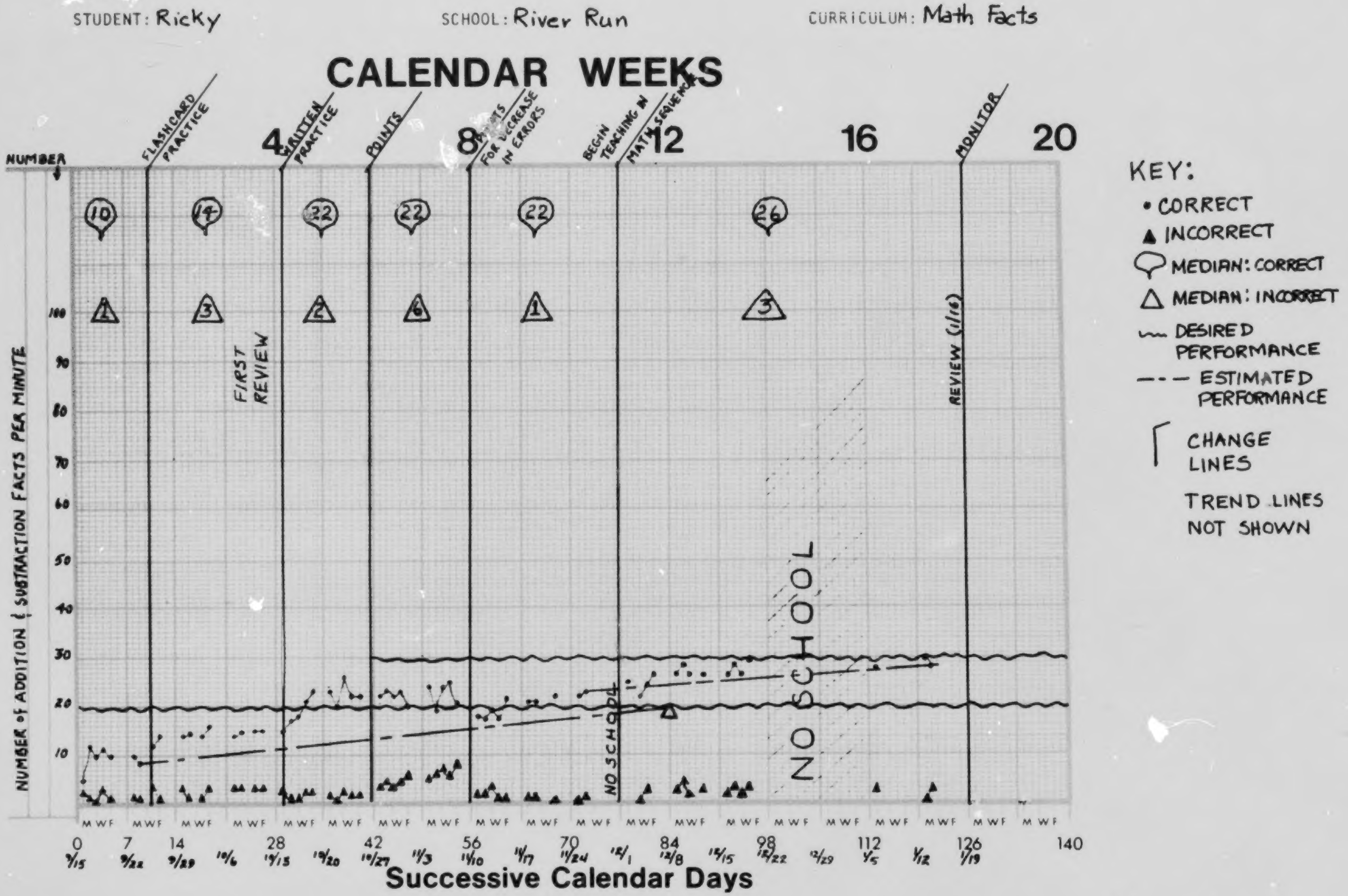
Graph 14d-1. Progress evaluation review: Ricky's weekly progress on math sequence.

KEY: Δ DESIRED LEVEL
--- ESTIMATED PROGRESS
• ACTUAL LEVEL (CUMULATIVE)

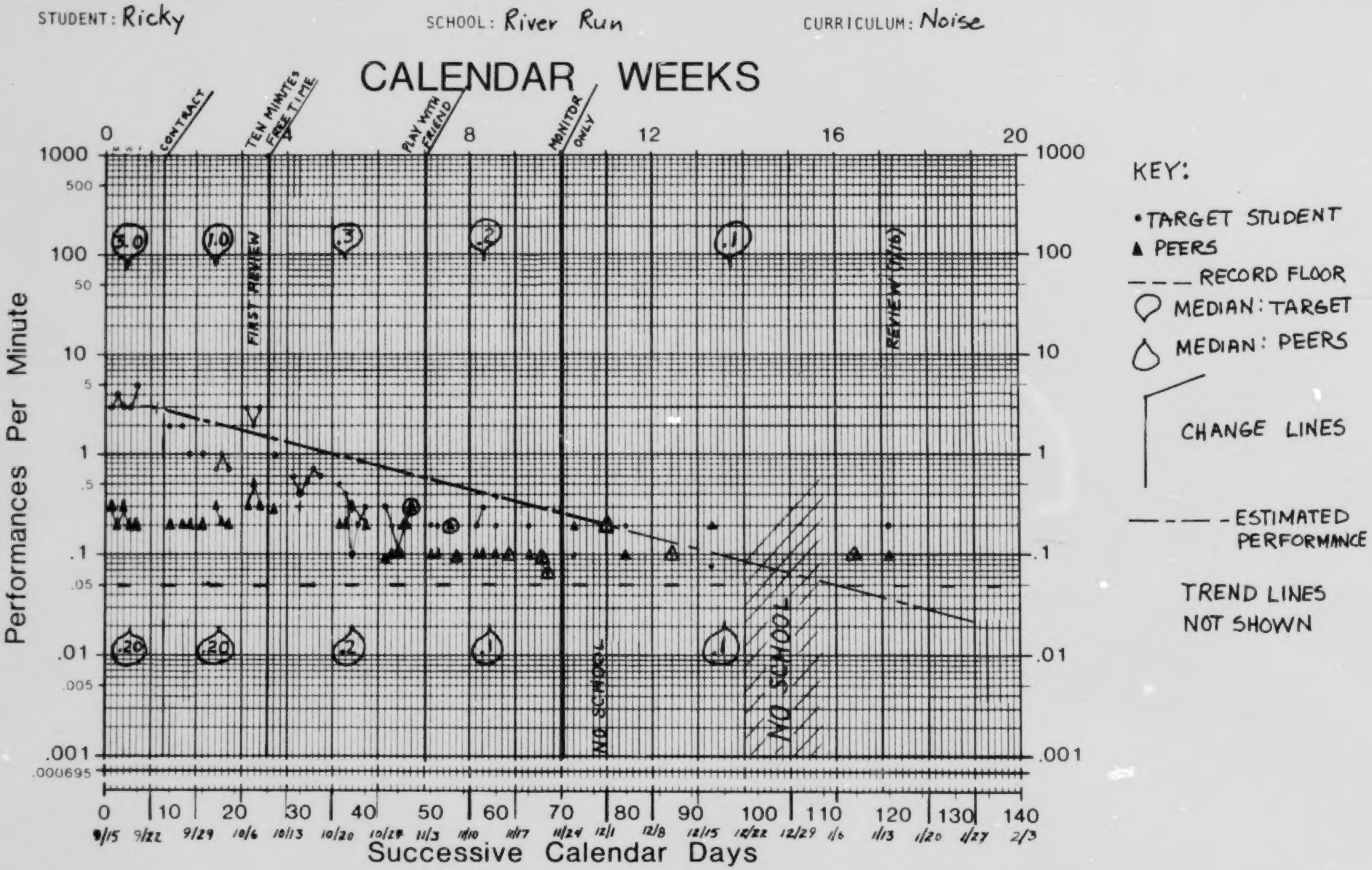
STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series



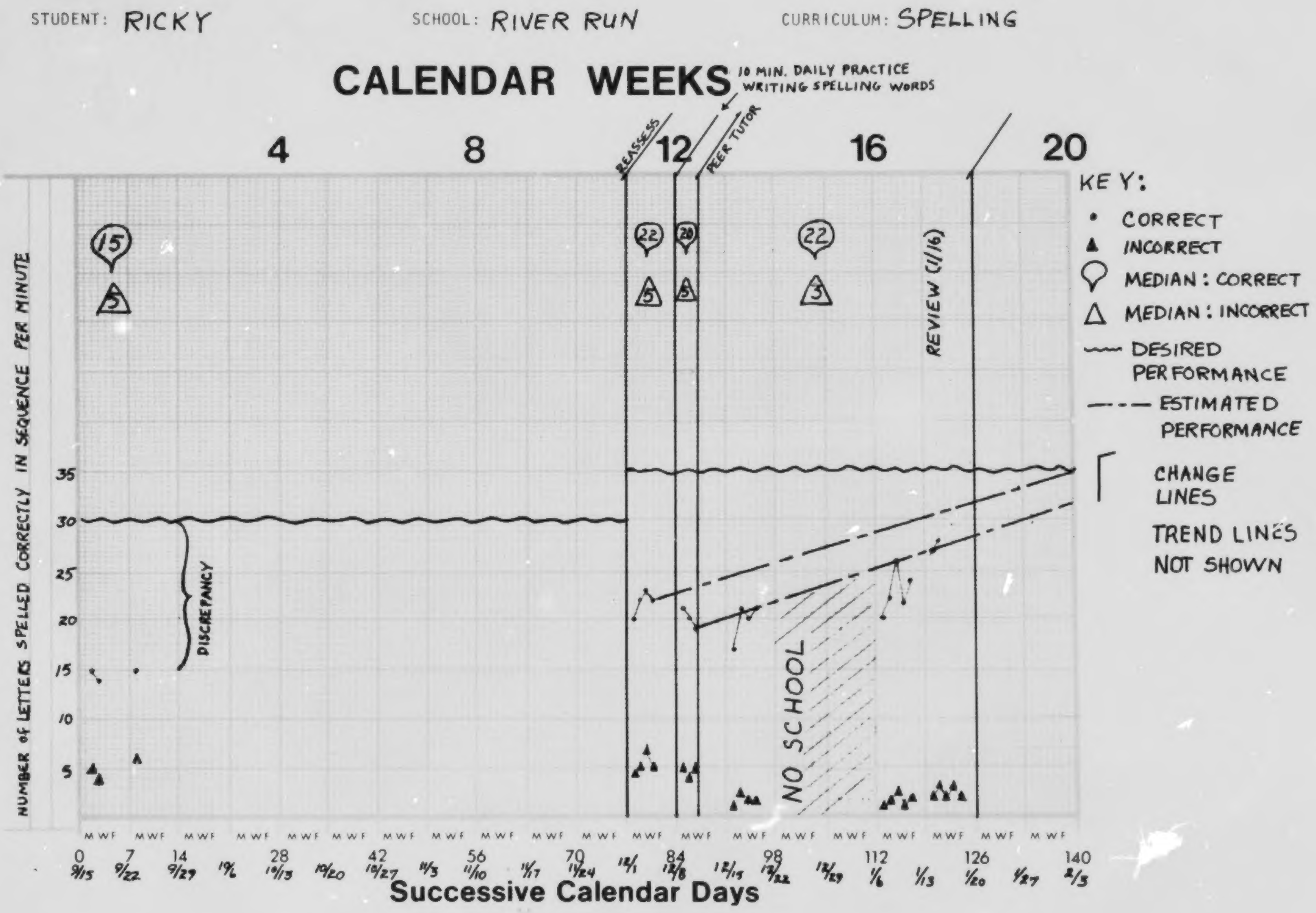
Graph 12f-1. Progress evaluation review: Ricky's daily progress, Read Series, showing three changes in the estimated progress line. Trend lines have not been drawn. The reader may practice drawing trend lines following the instructions on pp. 167-68. Use different color ink.



Graph 15e. Progress evaluation review: Ricky's daily performance, math facts, showing second desired performance line, second estimated performance line, and trend lines.



Graph 19e. Progress evaluation review: Data for Ricky and peers' noise in classroom.



Graph 16c. Progress evaluation review: Ricky's daily performance, Spelling.

DISCREPANCY RATIO WORKSHEET[a] ✓

Student Ricky School River Run Teacher Ms. B.

BEHAVIOR	9/25	11/1	12/1			1/1							
Reading	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.	20.0	21.0		1.2X	22.0							
ACTUAL LEVEL	4 mos.	5.5	6.5		1.6X	7.5							
DISCREPANCY	4.5X	3.6x	3.2x		1.4x Smaller	2.9X							
	less	less	less			less							

BEHAVIOR	9/25	11/1	12/1 (Reassess)			1/1							
Math Seq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.	No	21.0		1.2X	22.0							
ACTUAL LEVEL	5 mos.	Data	14.0		2.8X	15.0							
DISCREPANCY	3.7X.		1.4x		2.6X Smaller	1.5X							
	less		less			less							

BEHAVIOR	9/25	10/11	10/25	11/8		11/26	1/16		1/16				
Math Facts	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	20/min.	20	20	30	1.5X	30	30		1.5X				
ACTUAL LEVEL	10/min.	14	22	22	2.2X	22	26		2.6X				
DISCREPANCY	2.0X	1.4x	1.1x	1.4x	1.4x Smaller	1.4x	1.2x		1.6X Smaller				
	less	less	more	less		less	less						

BEHAVIOR	9/25	11/1	12/1			1/1							
Phonics Seq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.	No	No		No	No							
ACTUAL LEVEL	9 mos.	Data	Data		Data	Data							
DISCREPANCY	2.0X												
	less												

BEHAVIOR	9/25	12/5 (Reassess)				12/11							
Spelling	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	30/min.	35			1.2X	35							
ACTUAL LEVEL	15/min.	22			1.5X	20							
DISCREPANCY	2.0X	1.6X			1.2X Smaller	1.8X							
	less	less				less							

BEHAVIOR	9/25												
Handwriting	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	15/min.	No	No	No		No							
ACTUAL LEVEL	36/min.	Data	Data	Data		Data							
DISCREPANCY	1.2X												
	less												

BEHAVIOR	9/25	10/10	11/1	11/22		1/16			1/16				
Noise	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	.20/min.	.20	.20	.10	2.0X	.10			2.0X				
ACTUAL LEVEL	3.0/min.	1.0	.30	.20	15.0X	.10			30.0X				
DISCREPANCY	15X	5x	1.5x	2.0x	7.5X Smaller	1.0X			15.0X Smaller				
	more	more	more	more									

BEHAVIOR	9/25		12/10 (Reasses)	
Off Task	Init. Assess.	Change	Change	Change
DESIRED LEVEL	.50/min.		.40	
ACTUAL LEVEL	3.0/min.		.30	
DISCREPANCY	6.0X More		1.3x more	

---

[a] Out-of-place and physical contact data are not included due to space limitations. The discrepancies for these behaviors are 2.3X more for out of place and 1.0X for physical contact.

CASE REPORT SUMMARY ELEVEN

This form is completed at progress evaluation periodic reviews.

Student	Grade	Age	Teacher
Ricky J.	3	9	Ms. B.

IV. PROGRAM IMPROVEMENT

13. What information is available on cumulative progress/performance to date?
What data are available for each program change?
What is the change in the discrepancy ratio from initial assessment?
Have programs been developed since the last periodic review?

Summarize data over program changes here. List behavior new since last periodic review.

Behavior	Trend	Level	Variability	Step at Intervention
Reading	[✓ Positive] Negative	[✓ Increase] Decrease	None	Up Down [✓ None]
Math Facts	[✓ Positve] Negative	[✓ Increase] Decrease	Some	Up Down None
Noise	[✓ Positive] Negative	Increase [✓ Decrease]	Some	Up [✓ Down] None
Math Progress	[✓ Positive] Negative	[✓ Increase] Decrease	None	Up Down [✓ None]
Spelling	[✓ Positive] Negative	[✓ Increase] Decrease	Some	Up [✓ Down] None

14. Is the program as implemented producing cumulative benefits for the student?
Are there positive changes in the discrepancy ratio?
Were some changes more effective than others?

Behavior	Changes which were most effective
Reading	Setting own daily goals
Math Facts	Beginning instruction in math sequence
Math Progress	None implemented
Noise	Contract, Note home daily
Spelling	

15. Can information gathered on program changes be useful to others?
Are all interested parties informed of progress?
Are there recommendations for future program modifications?

Behavior	Recommendations for changes. Review date 1/15/76
Reading	Chart own progress
Math Facts	Discontinue this program
Math Progress	Continue as at present
Noise	Monitor only
Spelling	Monitor only

Present:

Ms. B.	SERT
Principal	Ricky
Ms. J.	Ms. T.

PART VI

Developing Skills in DBPM: Certifying Program Completion

Introduction

Certifying a program to be satisfactorily completed, like the identification of important problems, involves both objective and subjective judgments. In Part VI, both dimensions of program certification are discussed in detail.

Two types of objective data can be obtained from the graphed record of a child's performance which indicate that a program is successful:

1. Data showing that the progress/performance discrepancy has been completely reduced (actual performance and desired performance lines are identical).
2. Data showing that the program as currently implemented will result in a complete reduction in the discrepancy by the end of the school year (indicated by a trend in the data that, if projected, would coincide with the desired performance line).

Although objective data are central to DBPM, subjectivity is always a part of decision making. Because subjectivity has a significant influence in decision making, we believe that it should be controlled as much as possible. In DBPM, the control is exercised by making subjectivity explicit rather than implicit and embedding the values that influence program certification decisions in a systematic framework. In Chapter X, both dimensions of program certification are discussed.

Although program certification includes many of the elements of program adjustment, it differs in its purposes and results. In program adjustment, decisions always focus on whether specific program changes are helping to reduce specific discrepancies. In program certification, the decisions always focus on whether the total special education intervention has been successful. Thus, a program adjustment decision addresses the question, "Has, for example, phonics instruction improved the student's word recognition skill?" For program certification, the question would be, "Has special education intervention eliminated the discrepancies that were the basis for the initial referral?"

In the jargon typically used by educational evaluators, program adjustment decisions are formative while program certification decisions are summative in nature. For a further discussion of the distinction between formative and summative evaluations, see Scarvia, Anderson, Murphy, and associates (1975).

Reference

Scarvia, B., Anderson, S. B., Murphy, R. T. & Associates. *The encyclopedia of educational evaluation: Concepts and techniques for evaluating education and training programs*. San Francisco: Jossey Bass, 1975.

Chapter X

PROGRAM CERTIFICATION IN DBPM: OBJECTIVE AND SUBJECTIVE EVALUATIONS

DECISION AREA:
Program Certification

PROGRAM PHASE
Outcome Evaluation

Contents

Overview
Measurement
Evaluation
Communication and Collaboration
Final Comments on Program Certification

Overview

The basic idea of DBPM is that individual program modifications should be devised when discrepancies in academic and social development are identified by people who occupy a significant place in the lives of students. Data-based program modifications require that (a) the identified discrepancies be measured and (b) the effects of the program modifications in reducing those discrepancies be continually monitored. When performance discrepancies have been reduced so that they no longer are considered important, the point has been reached when program modification can be certified as complete or successful.

The procedures for summarizing the effects of the program modifications are presented in Chapter IX under "progress evaluation" (pp. 164 et seq.). Whenever the median level of actual performance reaches the desired performance level the discrepancy between the desired and actual performance has been reduced to 1X difference (i.e., no difference at all) and objectively, then, the program has been modified sufficiently to solve the problems identified during the initial assessment.

One important value of the evaluation procedures presented in this Manual is that continuity of data collection is preserved from the initial assessment through program modification to outcome evaluation. Thus, the same type of data which led in the first place to judgments that a discrepancy existed are used to make judgments about whether a program is working and, finally, that the program has been successful. This continuity contrasts sharply with systems for modifying programs that rely on measurements of performance which are unrelated to actual classroom performance (e.g., individual standardized tests) and are usually obtained only at the beginning and end of a program.

In many school systems, it is not uncommon for a child's eligibility for special education services to be determined by a school psychologist or other professional who works outside of the classroom setting and bases eligibility judgments on standardized intelligence or personality tests. If the child is declared eligible for the special services, he must be "reassessed" by special educators; since they must determine the kind of intervention to organize for the child, they may use some kind of standardized achievement test as the basis for their judgments. During the intervention period, the special educator collects the available data on the child's performance which is generated by classroom exercises and the teacher's judgment. And another standardized achievement test may be used to measure the child's achievement upon program completion. Each set of test results used to assess the child's performance is a discrete unit that has nothing to do with preceding or succeeding test results. In fact, what is being measured is not differences in the child's performance but differences in the various test tasks.

Examples of Type of Data Collected

Decision	Traditionally	DBPM
Eligibility	-WISC IQ -Stanford Achievement -California Test of Personality	Discrepancies on mainstream curriculum tasks: -oral reading -comprehension -spelling -math computation and concepts, etc. Discrepancies in classroom: -noise -physical contact -out of place -off-task -social interaction, etc.
Objectives of Program Plan	-ITPA -SRA Reading and Math -Informal Reading Inventory	Same as for eligibility
Progress Evaluation	-percentage of objectives mastered -teacher estimates -"end of book" tests	Same as for eligibility
Program effectiveness (certification)	-Wide Range Achievement Test -behavior checklist -current curriculum placement	Same as for eligibility

Communication problems among the various personnel responsible for decision making are exacerbated in the traditional approach by the lack of continuity and focus in data-collection activities. Further, the lack of comparability in tasks used to measure performance throughout the program modification makes it impossible to make valid judgments about program effectiveness. Finally, pre- and posttesting of students, even when the same instruments are used, cannot be used as an evaluation design. (This issue is discussed in Ch. III.) Although the preceding example is, admittedly, an oversimplification, it depicts the greater degree of continuity in the data which are used for decision making in DBPM, and the potential for clearer communication among all the persons who are involved in the program modification process.

The important point here is that the evaluation procedures in program certification are identical to the procedures that are used in problem selection (see Ch. VI). Whatever data-collecting procedure was the basis for modifying a student's program in the first place is now the basis for determining whether the program has been successful. In practice, therefore, either the decision matrix approach (p. 115), the collaborative model (p.117), or some combination of both can be used to help answer the questions addressed during this final phase of D^{3}PM. These procedures are discussed in the remainder of this chapter.

DECISION AREA: *Program Certification*
PROGRAM PHASE: *Outcome Evaluation*

PROCESS: Measurement

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
17. What are present progress/performance discrepancies? What are present discrepancy ratios for all behaviors modified during the program? What is the present trend of the data?	Collecting summary data for the program certification decision. ①	Summarize data on the discrepancy ratio worksheet. Draw trend lines. ①
		Complete Part One of Case Report Summary Twelve.

Collecting Summary Data for the Program Certification Decision ①

The questions which must be answered affirmatively before a program can be certified as completed are as follows:

1. Have the discrepancies between desired and actual progress/performance been completely reduced? (If a decision matrix is used, the weighted discrepancy should be substantially reduced.)

2. If the discrepancies have not been completely reduced, is there evidence that the discrepancies can be reduced within a reasonable time period without further special education intervention?

The data needed to answer both questions are the most recent discrepancy ratios and trend data for each behavior for which a program was developed and implemented, as well as data on all previous programs which were developed and completed during program implementation.

The procedures for computing these data are described in Part V and are not repeated here. Carrying out the procedures for Ricky provides what is essentially a review, however.

EXAMPLE

The SERT drew trend lines for the last phase of each of Ricky's programs that was still in progress on Graphs 12g-2 and 14e-1. (Graphs 12g and 14e are also included here but trend data are not drawn on yearly progress graphs.) Graphs 12g-1 (Daily Reading Progress) and 16d (Spelling) are included so the reader can review the data collected since the last program review on January 16. The spelling program was terminated by the SERT on February 16. The daily progress graph in reading is part of the ongoing sequence of daily graphs by which the program was evaluated after every three changes. The discrepancy ratio data for the last phase of each program were entered on the Discrepancy Ratio Worksheet (p. 204).

The discrepancy ratio data, change over initial assessment data, and trend data for every implemented program modification were then summarized on the first part of Case Report Summary Twelve. (See page 203.)

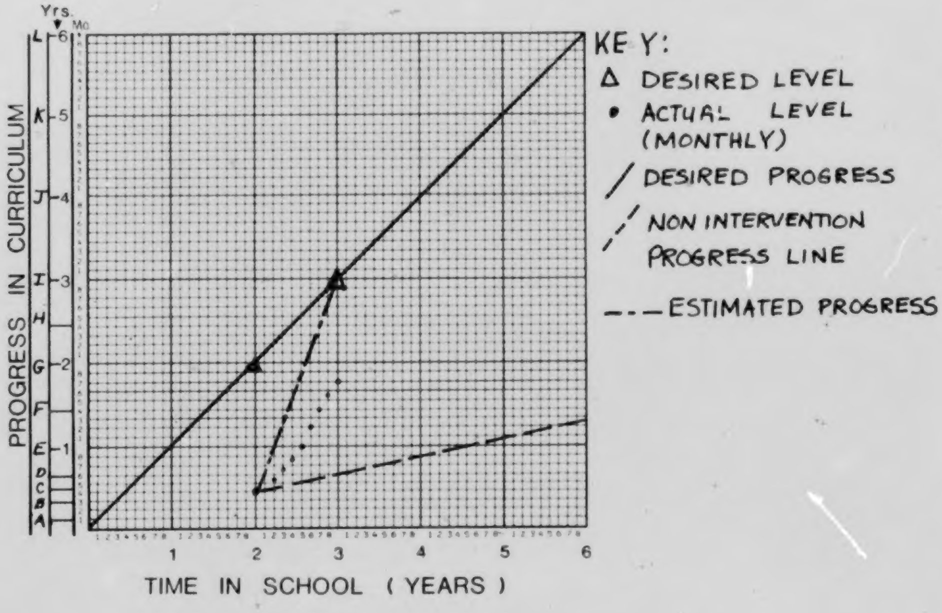
PROCESS: *Evaluation*

DECISION AREA: *Program Certification*

PROGRAM PHASE: *Outcome Evaluation*

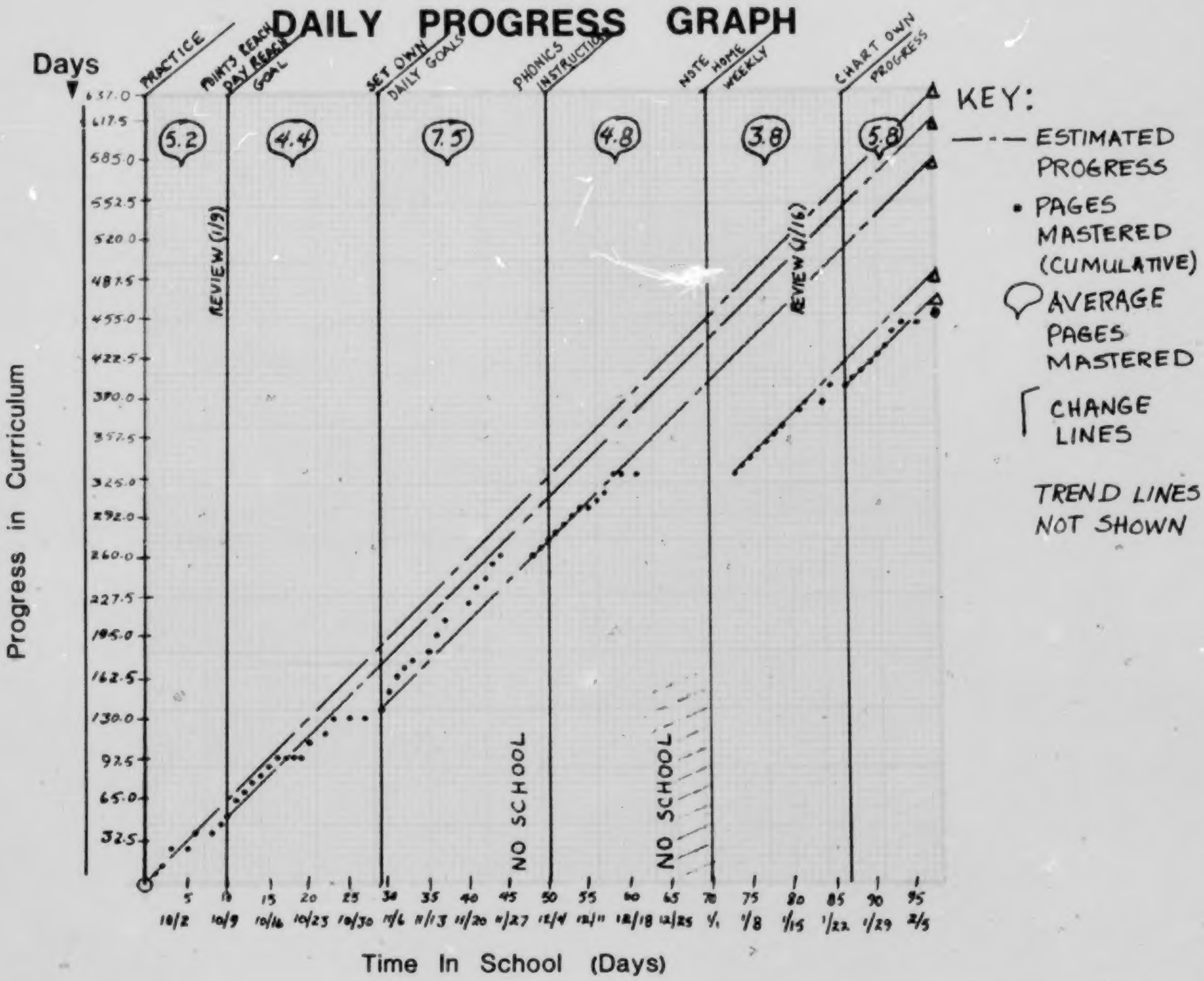
QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
18. Should the program as presently planned and implemented be terminated? Has program been successful in reducing the discrepancies? Can others assume responsibility for this student's program without assistance from Special Education personnel?	Guidelines for program certification decision. ①	Review summary data. Summarize and make recommendations. ①
		Complete Part Two of Case Report Summary Twelve.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series



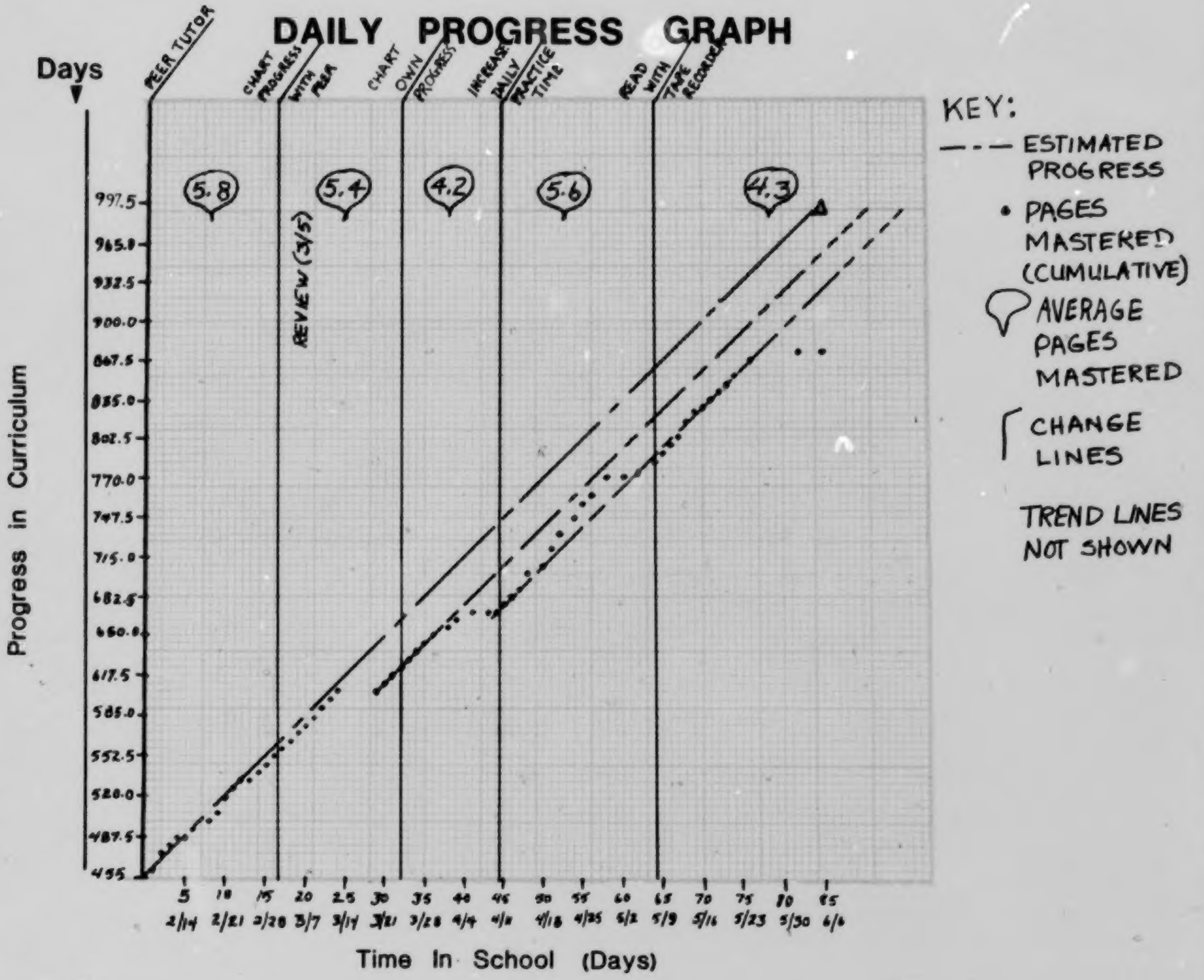
Graph 12g. Program certification review: Ricky's monthly progress, Read Series, data for 9-month school year.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series



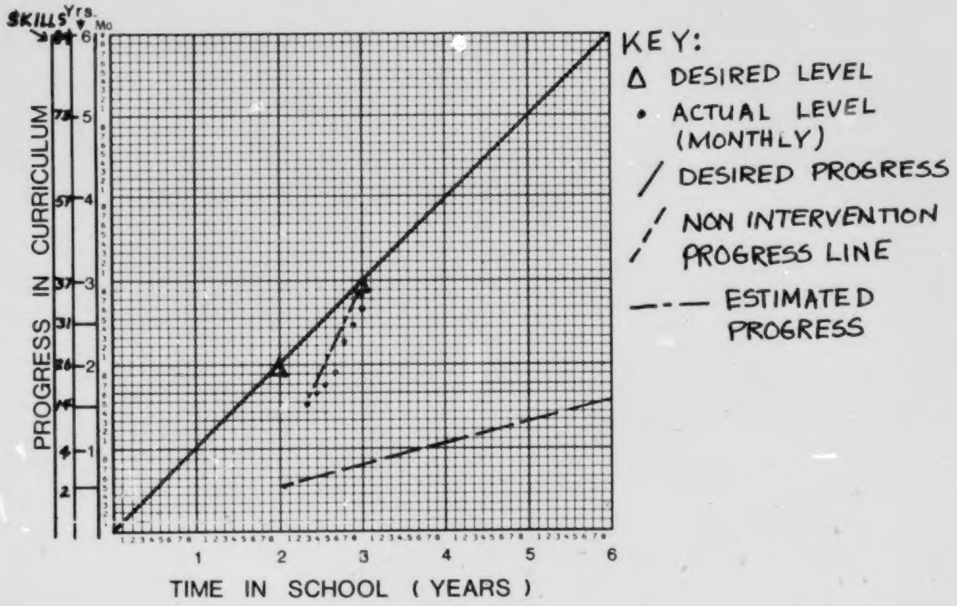
Graph 12g-1. Program certification review: Ricky's daily progress graph, Read Series, for period 9/27 - 2/5. Data collection continued on Graph 12g-2.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Read Series



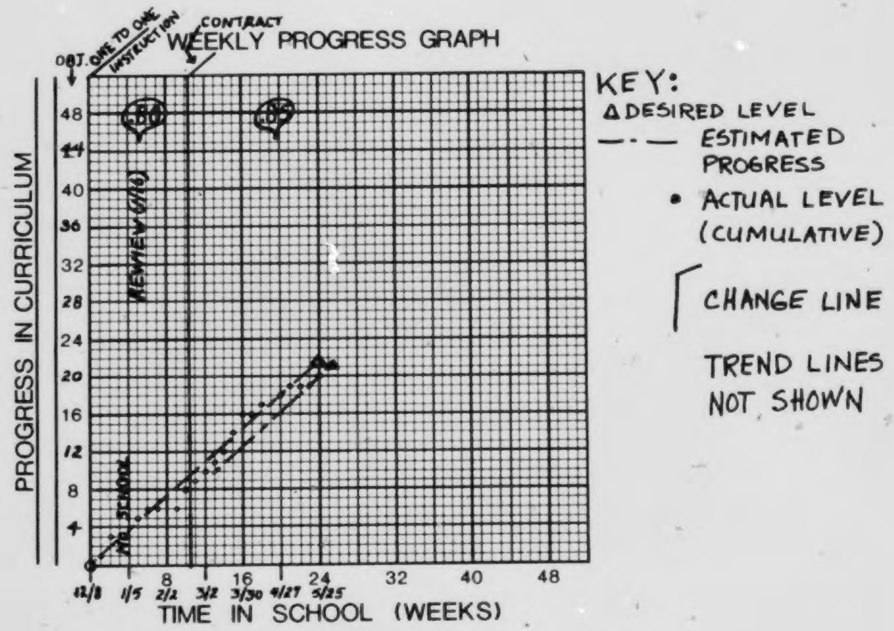
Graph 12g-2. Program certification review: Ricky's daily progress graph, Read Series, for period 2/4 - 6/6.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Math Sequence



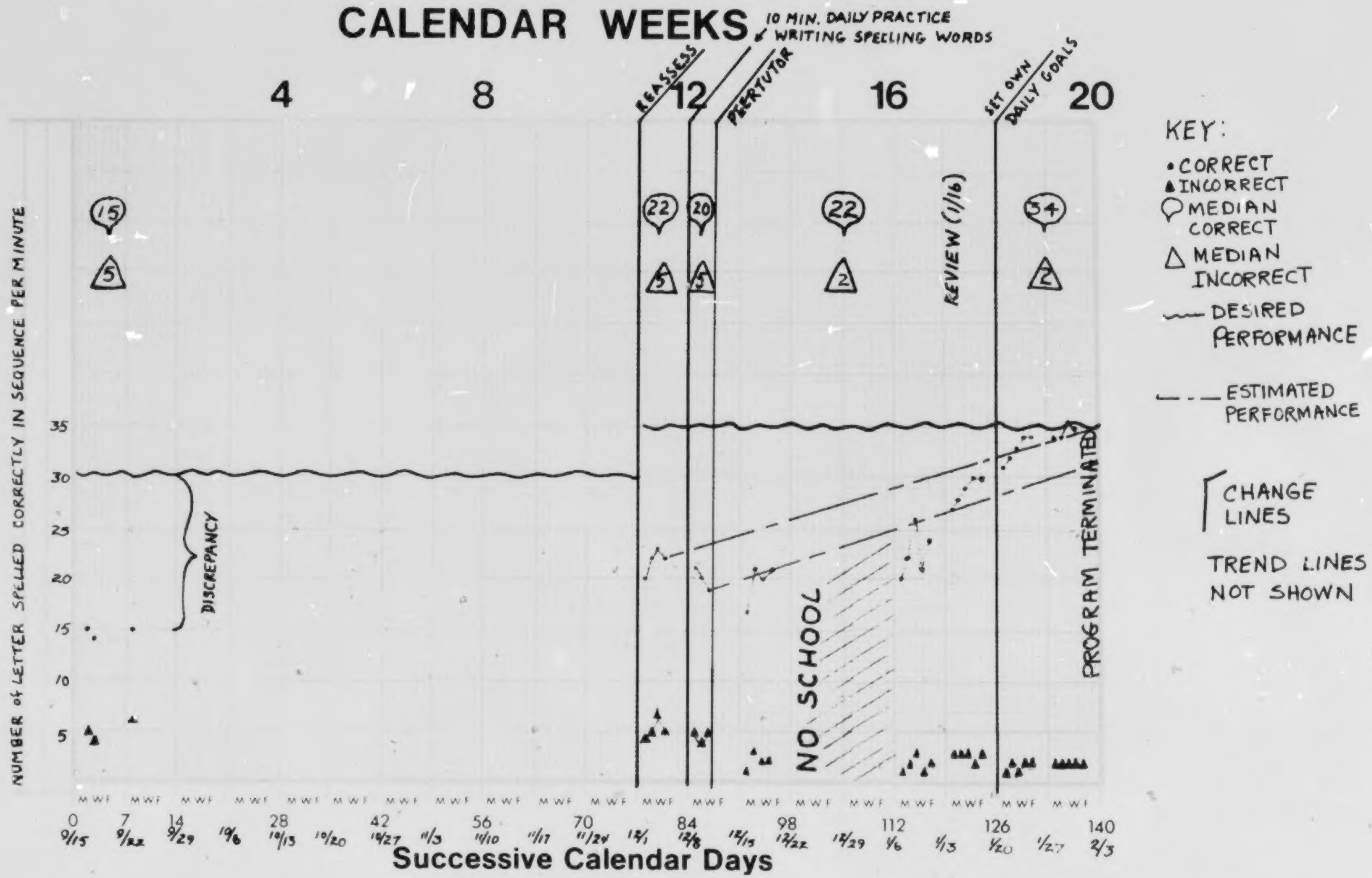
Graph 14e. Program certification review: Ricky's monthly progress graph, math sequence, data for 9-month school year.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Math Sequence

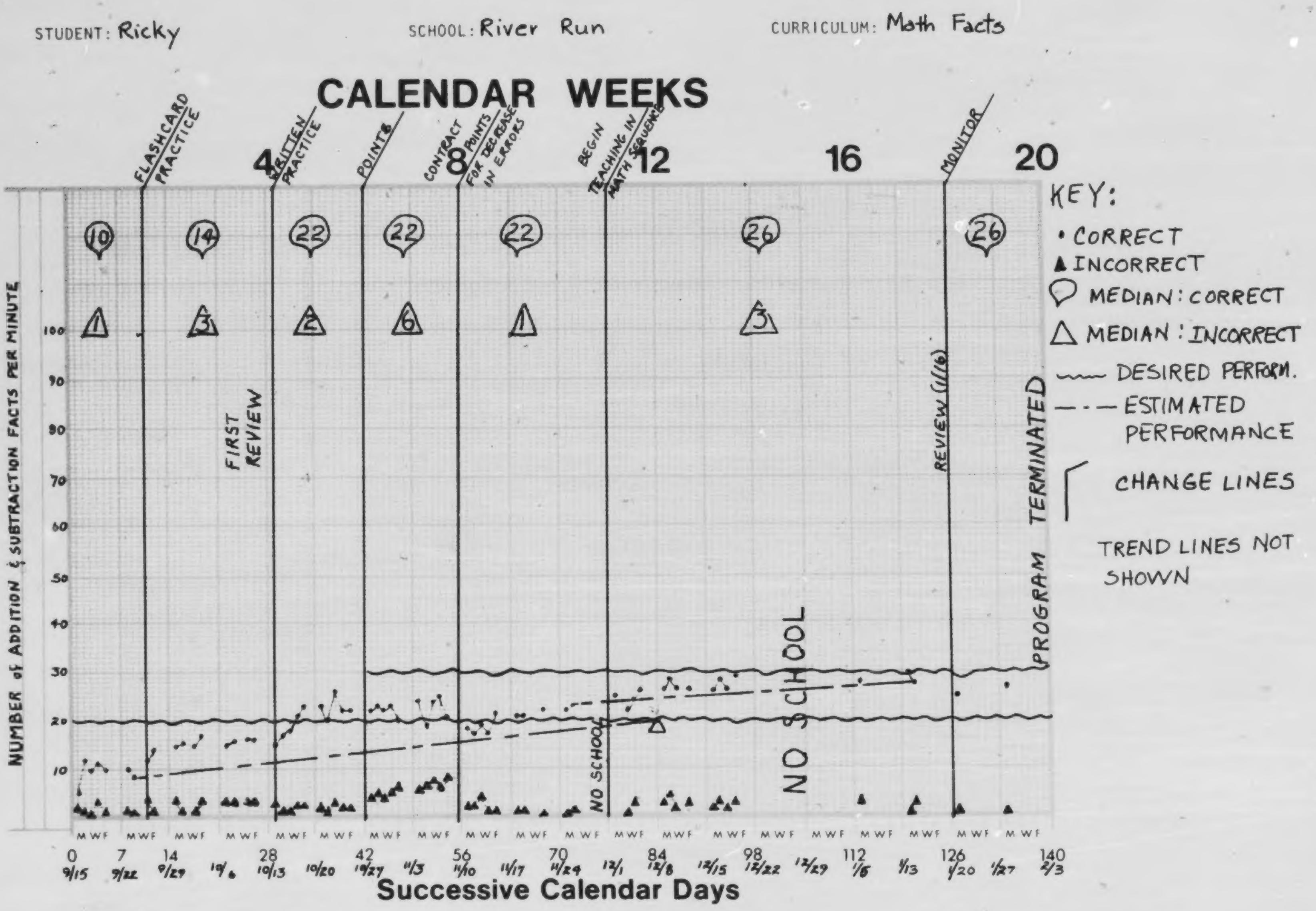


Graph 14e-1. Program certification review: Ricky's weekly progress graph, math sequence, data for entire program.

STUDENT: Ricky SCHOOL: River Run CURRICULUM: Spelling



Graph 16d. Program certification review: Ricky's daily performance graph, Spelling, data for entire program.



Graph 15f. Program certification review, Ricky's performance in math facts for period 9/15-2/3.

① Guidelines for Making the Program Certification Decision

As in the program eligibility decision, the collaborative or decision matrix approach can be used to make the program certification decision. If the decision matrix approach is used, the present discrepancy ratios are multiplied by the importance value of each behavior (determined when the eligibility decision was made) and the totals are compared to the original weighted discrepancies. In the following illustration, the same importance values are used as those given in the decision matrix for program eligibility (see Ch. VI, p. 117).

Behavior	Importance Value	X Present Discrepancy	= Present Total	Previous Total at Initial Assessment
Reading	15	1.7X	25.5	67.5
Math (Sequence)	10	1.1X	11.0	37.0
Noise	5	1.0X	5.0	75.0
Spelling[1]	10	1.0X	10.0	20.0
Weighted Discrepancy	40		$\frac{51.5}{40.0}$ = 1.3X	$\frac{199.5}{40.0}$ = 5.0X

During program certification, the current weighted discrepancy is compared to the original weighted discrepancy by dividing the larger number by the smaller. At present, the weighted discrepancy is 3.8X smaller than it was initially. The present discrepancy also can be compared to the discrepancy cut-off initially established for determining eligibility. Clearly, the 1.3X discrepancy is considerably smaller than the 2.0X cut-off recommended to determine program eligibility. Using the decision matrix does not exclude a review of the trend data, however. Although the over-all weighted discrepancy has been reduced, it is important to determine if all individual discrepancies have been completely reduced or will be reduced in a reasonable time period without further assistance from special education services.

The trend data for reading progress (for which a discrepancy still exists) indicates that progress is increasing with peer tutoring but this intervention has not completely reduced the initial discrepancy. It is quite likely, therefore, that special education intervention in reading will be required another year.

In the collaborative approach, the discrepancy and trend data also are reviewed but, as in the program eligibility decision, the program certification decision is based on group consensus rather than on precise numerical specifications.

EXAMPLE

At River Run School, the collaborative approach was used to make the program certification decision for Ricky. The review of the summary data on Case Report Summary Twelve, the Discrepancy Ratio Worksheet, and the trend lines on the graphs for the programs still in progress (reading and math skills) revealed the following:

The discrepancy in reading was not completely reduced. The trend of the data, however, indicated increasing progress. In math skills, the discrepancy was almost completely reduced and no further intervention appeared to be necessary.

---

[1] This behavior was not included in the matrix on p. 117.

All the program modifications for Ricky, except for reading, were successful enough to warrant certification of their success. Although, in reading, Ricky had made enormous gains (i.e., the discrepancy was now 2.6X smaller than during initial assessment), the reduction in discrepancy was not of sufficient magnitude to warrant complete program termination. Instead, the recommendation was made that indirect service through peer tutoring be continued.

This information is summarized in Case Report Summary Twelve. (See page 203.)

PROCESS: Communication and Collaboration

DECISION AREA: Program Certification
PROGRAM PHASE: Outcome Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
19. Has program been successful in satisfying the needs of all interested parties?	Program certification review procedures. ①	
Are all concerned persons aware of program outcomes? Are all satisfied?	Staffing Request Form. ②	Hold program certification review with team, parents, student. Make program certification decision. ②
		Complete Part Three of Case Report Summary Twelve.

Program Certification Review Procedures ①

The final step in the program certification decision is the team staffing. All parties to the referral should be present (or at least invited[2]) to participate in this decision regardless of which decision model is used. The data are presented and each person is given the opportunity to review the data, comment on the recommendations, and contribute additional data or recommendations. For Ricky, for example, the program certification decision is summarized on Case Report Summary Twelve.

Some Final Comments on Program Certification

In Chapter II, we discussed problems that are frequently encountered by resource teachers when they try to identify desired performance. The importance of making those desires explicit at the outset of modifying a program is manifest in the program certification process. Desires previously unmentioned or forgotten very often crop up when special educators try to get out of business with a child. During program planning, commitments to satisfactory program completion should be obtained from all responsible parties, including general education staff, parents, and special educators. This agreement should be established in writing as a part of the original planning contracts. If agreement is obtained, then individual values regarding the problems and their importance are negotiated well before consideration of whether the program has been satisfactorily completed. Thus, the commitment contract can be used as the basis for negotiating eventual program certification along the subjective dimensions which are always a part of program modification decisions. Gallagher (1972) made similar recommendations. In our experience, *the more explicit the contractual agreements at the point of initial program modification the less difficulty and conflict exist at the point of program termination.* No doubt it is impossible to avoid some disagreement on some occasions but formalizing the agreements prior to making decisions certainly helps to reduce a great deal of potential conflict.

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[2] See P.L. 94-142 regarding parents' and students' rights to attend and participate.

Perhaps a final statement on the role of desired performance in making program certification decisions should be given. Although in establishing programs the tendency always is to act as if performance discrepancies are reduced by changes in the actual performance of the student, we believe that many problems can be solved more quickly and simply by renegotiating desired performance. To do so requires that the individuals who are responsible for the development of children within educational programs be persuaded somehow that changes in desired performance are reasonable and called for. If our schools are to be pluralistic, in the same sense that we presume our American society is, then we must be open to alternative developmental goals as well as alternative programs. To require all children to learn to do or to become the same (i.e., desired performance to be the same for all children), from this viewpoint, is inappropriate. One of the responsibilities of program modifiers should be to impact on people's desires as well as children's performance.

② Staffing Request Form

To: Members of Student Support Team

From: SST Chairman[a]

May 24, 1976
Date

Here is a list of the students for whom referrals have been recieved since our last meeting.

Please list students whose programs should be reviewed.

Implementation Evaluation	Progress Evaluation	Program Certification
		Sally (Grade 5)
		Tom (Grade 4)
		Pat (Grade 2)
		Ricky (Grade 3)

The SST will convene in the resource room at 7:30 A.M. on June 2, 1976. Return this form to the SERT prior to the meeting.

---

[a] We recommend that the SERT chair this team.

Reference

Gallagher, J. J. The special education contract for mildly handicapped children. *Exceptional Children*, 1972, *38*, 527-535.

CASE REPORT SUMMARY TWELVE

Ricky J.	3	9	Ms. B.
Student	Grade	Age	Teacher

17. What are the present progress/performance discrepancies?
What are the present discrepancy ratios for all behaviors modified during the program?
What are the present data trends?

Enter summary discrepancy and trend data here[a]

BEHAVIOR	Present Discrepancy Date June 1, 1976	Change Over Initial Assessment	Trend
READING PROGRESS	1.7X LESS	2.6X SMALLER	Increasing
MATH PROGRESS	1.1X LESS	3.4X SMALLER	Increasing
SPELLING	1.0X	2.0X SMALLER	Stable
NOISE	1.0X	15.0X SMALLER	Stable

18. Should the program as presently planned and implemented be terminated?
Has program been successful in reducing discrepancies?
Can others assume responsbility for this student's program without assistance from Special Education?

Summarize data review and recommendations here.

The discrepancies for all Ricky's behaviors are less than 2.0X. There is essentially no discrepancy at present in math progress, spelling and noise behavior. While there is still a discrepancy in reading progress the trend of the data has been increasing throughout the program. It is recommended that the SERT work with Ricky's teacher to develop an indirect program for reading using peer tutors next year.

19. Has program been successful in satisifying needs of all interested parties?
Are all parties aware of program outcomes?
Are all satisfied?

Summarize results of staffing here.

Everyone expressed satisfaction with Ricky's achievements during the program. Ricky showed continued growth throughout all program changes. Self charting, establishing own goals, and contracting were particularly successful in increasing median levels of progress and performance in all areas. Peer tutoring was demonstrated to be useful as an intervention. Points were less reinforcing than other interventions. The decision was made to maintain this level of achievement through indirect service in reading next year and monitoring of progress in other content areas periodically.

Date Completed June 1, 1976

[✓ Continue] Direct [✓ Indirect]

Terminate

Present Ms. B. Principal
Ms. J. Social Worker - Ms. T.
Ricky
SERT

[a] If decision matrix is used place matrix here.

DISCREPANCY RATIO WORKSHEET

Student Ricky School River Run Teacher Ms B.

BEHAVIOR	9/25	11/1	12/1			1/1	2/1	3/1		4/1	5/1	6/1	
Reading	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18mos.	20.0	21.0		1.2x	22.0	23.0	24.0	1.3x	25.0	26.0	27.0	1.5x
ACTUAL LEVEL	4mos.	5.5	6.5		1.6x	7.5	9.0	11.0	2.7x	13.0	14.5	16.0	4.0x
DISCREPANCY	4.5x	3.6x	3.2x		1.4x smaller	2.4x	2.6x	2.1x	2.1x smaller	1.9x	1.8x	1.7x	2.6x smaller
	less	less	less			less	less	less		less	less	less	

BEHAVIOR	9/25	11/1	12/1 (Reassess)			1/1	2/1	3/1		4/1	5/1	6/1	
Math Seq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18 mos.	No	21.0		1.2x	22.0	23.0	24.0	1.3x	25.0	26.0	27.0	1.5x
ACTUAL LEVEL	5 mos.	Data	14.0		2.8x	15.0	16.0	17.5	3.5x	20.5	22.0	24.0	4.8x
DISCREPANCY	3.7x		1.4x		2.6x smaller	1.5x	1.4x	1.4x	2.6x smaller	1.2x	1.2x	1.1x	3.4x smaller
	less		less			less	less	less		less	less	less	

BEHAVIOR	9/25	10/14	10/25	11/8		11/26	1/16		1/16				
Math Facts	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	20/min	20	20	30	1.5x	30	30		1.5x	Terminated (2/3)			
ACTUAL LEVEL	10/min	14	22	22	2.2x	22	26		2.6x				
DISCREPANCY	2.0x	1.4x	1.1x	1.4x	1.4x smaller	1.4x	1.2x		1.6x smaller				
	less	less	more	less		less	less						

BEHAVIOR	9/25	11/1	12/1			1/1	2/1	3/1		4/1	5/1	6/1	
Phonics Seq.	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	18mos.	No	No		No	No	No	No	No	No	No	No	No
ACTUAL LEVEL	9mos.	Data	Data		Data	Data	Data	Data	Data	Data	Data	Data	Data
DISCREPANCY	2.0x												
	less												

BEHAVIOR	9/25	12/5 (Reassess)				12/11	1/18	2/5	2/5				
Spelling	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	30/min	35			1.2x	35	35	35	1.2x	Terminated (2/3)			
ACTUAL LEVEL	15/min.	22			1.5x	20	22	34	2.2x				
DISCREPANCY	2.0x	1.6x			1.2x smaller	1.8x	1.6x	1.0x	2.0x smaller				
	less	less				less	less	less					

BEHAVIOR	9/25												
Handwriting	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	45/min.	No	No	No		No	No	No		No	No	No	
ACTUAL LEVEL	36/min.	Data	Data	Data		Data	Data	Data		Data	Data	Data	
DISCREPANCY	1.2x												
	less												

BEHAVIOR	9/25	10/10	11/1	11/22					1/16				
Noise	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	.20/min.	.20	.20	.10	2.0x	.10			2.0x	Terminated (1/16)			
ACTUAL LEVEL	3.0/min	1.0	.30	.20	15.0x	.10			30.0x				
DISCREPANCY	15x	5x	1.5x	2.0x	7.5x smaller	1.0x			15.0x smaller				
	more	more	more	more									

BEHAVIOR	9/25		12/10										
Off Task	Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.	Change	Change	Change	Change from Init. Assess.
DESIRED LEVEL	.50/min.		.90		Reassessment indicated almost complete reduction								
ACTUAL LEVEL	3.0/min.		.30		in discrepancy - no intervention necessary.								
DISCREPANCY	6.0x more		1.3x more										

PART VII

Consultation and Training

Introduction

Up to this point DBPM has been described as procedures to solve the progress and performance problems of individual students. Special education resource teachers play a key role in applying the processes of measurement, evaluation, and communication and collaboration to identifying students' problems and planning, implementing, and adjusting programs to resolve the problems. The presentation has been made from the perspective of a professional SERT who assumes primary or shared responsibility--direct service--for improving the individual student's program. In this Part there are outlined the final two processes managed by the SERT, processes in which the perspective is changed from direct service to children to indirect or supportive service to children through the processes of consultation and training. The format of the following chapter differs from that followed in previous chapters. First, the rationale for the SERT's activities in consultation and training is discussed, then consultation strategies and the matrix cell questions and activities are listed. Unlike other matrix listings, the materials and procedures to implement the activities are not provided. Instead, the reader is referred to appropriate preceding chapters for the necessary information. In conclusion, one consultative case study is presented.

Chapter XI

CONSULTATION AND TRAINING: PROCESSES FOR ALL DECISION AREAS AND PROGRAM PLANS

Contents

Definition and Rationale

Strategies for Solving Consultative Problems

Matrix Questions

Case Study

Definition and Rationale

Teaching--direct service--is a familiar role for SERTs. Developing skills to identify problems, plan instruction, and implement and adjust instructional routines fit easily into their traditional role requirements. Indeed, most teacher education programs focus almost exclusively on direct service to children.

In contrast, providing indirect services to exceptional children by consulting with or training classroom teachers is a less familiar role for SERTs and one that is not easily understood even by the most experienced teachers. Consultation and training enlarge the SERT's role and interject new facets in the professional relationship of the SERT and regular classroom teacher. The first three steps in training SERTs as consultants and teacher trainers are (a) to establish the goal, (b) to clarify the role, and (c) to justify the process.

The Goal

The goals and processes of consultation can be discussed from many points of view and a variety of theoretical models (Parker, 1975). From our viewpoint, the goal of consultation for SERTs is to insure that a client, usually the classroom teacher, implements DBPM for individual students who are eligible for special education service. The measure of effectiveness, then, is the extent to which the SERT is successful in helping client teachers to use DBPM to solve the identified progress and performance problems of students in the regular classroom.

The goal of training in DBPM, on the other hand, is to teach to one or more people[1] the skills that are needed to use the procedures effectively. This Manual, therefore, is a training medium. The measure of effectiveness in training is the degree to which trainees can demonstrate skill in using DBPM with the sets of problems which are typically faced by the trainees. While success in consultation is determined by the client's effectiveness in working with the SERT to solve the problems of specific students through DBPM procedures, success in training is evaluated by the extent to which trainees can successfully implement the activities of DBPM regardless of the particular problem presented and without the immediate assistance of the SERT. When DBPM has been learned through consultation, the learning is a secondary outcome; the learning is a primary outcome when it has been achieved through training. The difference between the two is a very fine line sometimes. The justification for including both consultation and training as part of the SERT's responsibility follows.

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[1] Regular class teachers, aides, volunteers, cross-age tutors, parents, principals, social workers, psychologists.

The Role

The simplest schema for clarifying the consultation role is that presented by Tharp & Wetzel (Fig. XI-1).

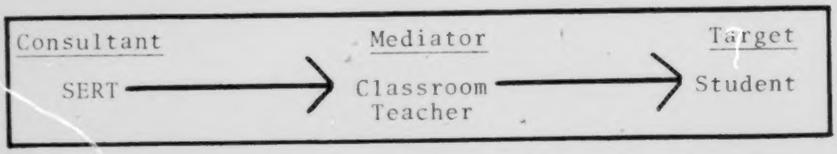

Fig. XI-1. The triadic model of consultation. Adapted from R. Tharp & R. Wetzel, *Behavior modification in the natural environment*. New York: Academic, 1969.

In Tharp & Wetzel's analysis, the consultative relationship describes "functional positions, not people who occupy those positions" (p. 47); for our purposes, however, the SERT occupies the consultant position; the classroom teacher, the mediator role; and the student, the target role. The analysis clarifies that the SERT is in a consultative relationship with the teacher when (a) the student is the target of the change effort, (b) the teacher works directly with the student, and (c) the SERT works with the teacher to help to change the student's behavior. Earlier in this Manual (Chapter VII) eight different types of service were presented for consideration when administrative arrangements were to be selected. Four of those types of service were identified as "indirect." Examination of the triadic model makes it clear that all consultation is indirect service. If the SERT occupies the mediator position and the teacher occupies the target position, then the SERT is a teacher trainer, not a consultant. But the activities of training are indirect service also as the SERT is not managing DBPM for a given student or students.

Rationale

Not all special educators, and certainly not all classroom teachers, accept the position that the SERT should act as a consultant and trainer. What, then, is the rationale for these role functions? Five reasons are offered here.

1. Since performance problems are defined as the discrepancy between what someone (usually the teacher) desires and what someone (usually the student) does, and since the appropriate solution to the problem may lie in changing the desire rather than the behavior of the student, it follows that someone in the school may need to influence (i.e., to mediate or train) the teacher's desires as they are manifested in teacher behavior.

2. Since teachers refer students to special education at a rate exceeding the direct service capacity of special educators, some mechanism for reducing the need for direct special education service must be provided.

3. Since education in the least restrictive alternative (environment) is mandated and most often interpreted as regular education classrooms, special education resources must be provided through the general education program rather than as a parallel special education program.

4. Since teachers, like other professionals, inevitably confront problems for which assistance is required, the help should be readily available in the form of trained school-based (rather

than itinerant) professionals.

5. Since the need for special education sometmes can be reduced best by systematic change in the school program rather than individual problem solution, resources must be continuously applied to improving the general educational program of a school to serve the needs of exceptional children.

We believe that a school-based SERT is in a particularly appropriate position to provide the outlined services.

Consultation and Training Activities

Decision Area	Consultation Activity
Problem Selection	1. Teacher identifies the need for assistance from SERT in developing a program modification for a student in his/her class. 2. SERT meets with the teacher to help pinpoint the specific behavior which the teacher wishes to modify. 3. SERT provides teacher with necessary materials and assistance to collect data on the discrepancy between the student's current level of functioning and the desired performance for the pinpointed behavior. 4. SERT helps teacher to summarize the data collected and establish importance of the problem.
Program Selection	5. SERT meets with the teacher and student (and parent) to develop a program modification. 6. Guidelines are established for implementing and monitoring the program modification and the responsibilities of all persons involved are defined. 7. Commitments are elicited from persons involved on their willingness to participate in the program plan. The result of this action is usually in the form of a contract (Fig. XI-2).
Program Operationalization	8. Teacher begins to implement plan. 9. SERT assists teacher as specified in contract.
Program Improvement	10. SERT and teacher meet to evaluate effectiveness of program plan weekly or at least every other week. 11. SERT assists teacher in summarizing data and generating alternative strategies on the basis of data collected by teacher. 12. Teacher implements program changes as agreed upon and continues with program operationalization.
Program Certification	13. Teacher meets with student and parent (when appropriate) to evaluate objectives achieved and determine if program should be terminated.

Consultation Agreement

Target Behavior

1. Fighting in the halls and on the playground.
2. Swearing in the halls, in the lunchroom, and on the playground.
3. Loud and boisterous behavior in the halls and the lunchroom.

Procedures

Each morning the student will fill in a daily record form. This form will remain in the classroom and should be marked each time the student returns from an activity in which the behaviors listed above could occur. At the end of the day, a final evaluation will be made by the student and teacher. At the end of each week new goals will be set for the following week.

Student Responsibilities

1. To fill in a daily record form each day.
2. To be responsible for keeping count of target behavior.
3. To check the appropriate space on the daily record as soon as possible after the behavior has occurred.
4. To summarize each day's total and sign the daily record.
5. To have the daily record signed by the classroom teacher each day.

Teacher Responsibilities

1. To provide the daily record forms.
2. To monitor the student's contract daily.
3. To allow time at the end of each day for evaluation with the student and at the end of each week for consultation with the SERT.
4. To sign the student's daily record each day.
5. To chart the student's progress weekly.
6. To develop a reinforcement menu for the student for points earned.
7. To set goals with the student each week.
8. To call the SERT whenever necessary.

SERT's Responsibilities

1. To confer with the teacher and help to write a contract with the student.
2. To help teacher to develop a reinforcement menu which has point values.
3. To aid teacher in charting weekly progress of student.
4. To spend one-half hour every Friday assisting teacher in goal setting for the next week.

__________________	__________________	__________________
Teacher's Signature	SERT's Signature	Student's Signature

Date Completed __________________

Fig. XI-2. Consultation agreement among SERT, regular classroom teacher, and student identifying the responsibilities of each.

Here is an example of a sequence of training activities conducted by a SERT with a classroom teacher.

Decision Area	Training Activity
	1. Teacher requests training in DBPM.
	2. Teacher selects student perceived to be having difficulty with classroom activities.
Problem Selection	3. SERT and teacher review data on history; interview student (and parent).
	4. SERT provides materials, and training in their use, to enable classroom teacher to collect data on discrepancy between student's current level of functioning and desired performance for the academic behaviors identified.
	5. SERT provides training and materials to the classroom teacher for collecting data on social behavior of target student and peers.
	6. Teacher collects data on academic and social behaviors.
	7. SERT provides training to teacher which enables her/him to summarize the collected data; write a rationale for the importance of the problem.
Program Selection	8. SERT trains teacher to evaluate data and develop a program plan for the high-priority behaviors identified. The plan may include peer tutoring. Teacher agrees to participate in supervision of peer tutoring.
	9. SERT implements activities for training peer tutor and teacher to operationalize program plan.
	10. SERT supervises as teacher monitors peer-tutoring program, and SERT trains teacher to summarize data collected.
Program Adjustment	11. SERT trains teacher to evaluate data collected and decide on program adjustments.
Program Certification	12. SERT meets with teacher to evaluate objectives achieved and determine if program should be terminated.

An example of a training agreement among a SERT, classroom teacher, peer tutor, and student, which covers activities and materials for program implementation, is given in Fig. XI-3.

To summarize, in consultation, the SERT helps someone else solve specific problems using DBPM procedures rather than solving the problem alone, and in training, the SERT's objective is to teach other persons to use DBPM procedures.

The procedures and materials needed to provide these services should be developed for the particular person or situation in which consultation or training is being offered.

Strategies for solving consultation problems (see also Chapter VII)

Assuming personal responsibility for insuring that programs are implemented by others as planned is no small step for the SERT. The immediate responsiblity assumed by the SERT is for the service that is provided to the referred student by others, a responsiblity that may produce discomfort. Typically, the SERT's teaching colleagues are not familiar with the concept of

Training Agreement

(1) SERT Responsibilities:

1. To train peer tutor and student, to develop and operationalize program plan.

2. To monitor the program for interventions and incentives.

3. To provide sample sheets for taking daily rates in basic facts.

4. To provide material for practicing facts each day.

5. To provide sample materials for determining mastery of skills in the math sequence.

6. To provide graphs for the tutor, the student, and the teacher to record data on progress/performance in math.

7. To train tutor, student, and teacher in graphing procedures.

8. To spend one-half hour in the classroom each Thursday to monitor program and assist in setting goals for the following week.

(3) Student Responsibilities:

1. To plot his daily progress on the daily graph.

2. To work in a cooperative manner with his peer tutor.

3. To practice the basic facts of multiplication daily.

(2) Peer Tutor Responsibilities:

1. To practice facts with student each day for 10 minutes using procedures taught by SERT.

2. To get a one-minute written sample of the basic facts from the fact sheet each day.

3. To assist the student in summarizing and plotting his data each day.

4. To record information of daily timing on sheets provided by the SERT.

5. To meet with SERT for 15 minutes on Thursdays.

(4) Teacher Responsibilities:

1. To arrange space in classroom for peer-tutoring activities.

2. To see to it that all materials are available.

3. To check graph and summarize data with peer tutor and student.

4. To meet with SERT on Thursdays to evaluate data and set goals for following week.

5. To administer the weekly mastery tests.

Directions for Peer Tutor:

Using the rate sheets given to you by the SERT, get a one-minute sample of the student's performance each day. Have the student skip the problems he does not know during this one-minute sample. At the end of the timing count the total number tried, then subtract the number of incorrect tries. This will give the number of facts correct and incorrect/minute. Help the student to graph the number of facts correct and the number of facts incorrect on the daily performance graph.

Directions to Teacher:

Once a week, take a five-minute sample of the student's progress in mastering the skills in the math skill sequence using materials supplied by the SERT. At the end of timing count the total number of digits correct and divide by 5. If the rate of digits correct per minute is between 50 and 75, plot a mastery point at the intersection of the line representing the skill on the vertical axis and the line representing the calendar week on the horizontal axis.

Fig. XI-3. Example of agreement for responsibilities and materials for training in program implementation. The pinpointed behavior is # of multiplication facts correct/min.

"shared responsibility"; for them, a student's day is divided among curriculum areas like"reading" and"math" or services like "regular," "special," and "remedial," in which each teacher assumes the right to "do his/her own thing" with the student. Even in continuous progress or "open" programs teachers do not expect colleagues to follow the same instruction, even informally. Teachers are trained to function individually rather than as team members.

When the SERT shares responsibility for a discrepant child's program, uncertainty and conflict are common initially in the relationship with the classroom teacher. A common response to this problem, if the SERT consultation role is not a familiar one, is to avoid and escape those indirect service activities that produce conflict and to concentrate on the more familiar direct service functions. In one school district, we have been told that although special education teachers were provided with from 25-50 percent of the day for the indirect service activities which are required by the consultant role, within five months of assuming that role virtually all of the special education teachers had returned to 100 percent direct service to children. Their chief explanation was that the regular classroom teacher "didn't want to work with them" and were "uncooperative."

How does the SERT succeed in operationalizing a program as a cooperative venture? No simple answer is available, unfortunately. However, teacher performance is influenced by the same general principles that influence student performance. A systematic analysis of the performance problems occurring during program operationalization can be helpful to the SERT who identifies discrepancies between the desired performance of implementors written into the program plan and the actual performance of those implementors during program operationalization. Mager and Pipe (1970) have provided an excellent framework for analyzing such problems. A few simple questions from that framework are helpful to stimulate solutions to common performance problems.

1. Is the performance expected (desired) from each implementor clear? If not, the SERT can demonstrate the performance or write it into a contract which all may sign.

2. Is the actual performance of any implementor substantially discrepant from the desired performance? To answer this question it may be necessary for the SERT to observe the implementor's attempts to perform as desired.

3. If a discrepancy exists, is it important? If a discrepancy is not important to probable program success, ignore it. If it is important (and to so determine you may need to communicate with other concerned parties), then try to determine why the implementor is not performing as desired.

(a) Is the performance something the implementor can do, but is not doing? If so, the problem is not due to a lack of skill and can be solved if the SERT can take the following actions:

(1) Change the consequences that occur when the implementor performs as desired. In doing so, remember that the consequences operating on the implementor can be both positive and negative. A person may be able to do something but will refrain from it if the result is unpleasantness. For example, a teacher may be able to observe and record behavior but does not because other students become disruptive during the process. In effect, he is being punished for carrying out an important component of DBPM. To get the teacher to observe and record the target student's behavior, the SERT must make sure that the punishment does not occur. Similarly, a teacher may be able to manage a peer-tutoring program in the classroom but at the cost of time ordinarily devoted to evaluating students' work. Again, the SERT can effectively remove the unpleasantness by using

indirect service to ensure that performing as desired does not cost the teacher valued time. Finally, initial attempts by the implementor to perform as desired go unrecognized, too often. The SERT can insure positive social consequences for even small approximations of desired performance by daily checking in with the implementor to "see how things are going." These "stop-bys" by the SERT and the principal, counselor, or social worker emphasize the importance of desired performance and provide the occasion for social reinforcement. (Notes to the principal about good efforts by implementors are especially effective reinforcers!)

(2) Make the desired performance easier for the implementor to accomplish. For example, data recording is much easier to do if all the materials are provided and are easy to use. Implementing an alternative curriculum in the classroom is easier initially if someone else provides the materials, plans the lessons, provides directions to the student, and organizes the time and space. Managing a peer-tutoring program is easier if someone else recruits and trains the peers, organizes the lessons, and develops a daily system that results in clearly organized graphs for the teacher to inspect. All of these things may seem to be things the teacher "really oughta wanna" do (Mager & Pipe, 1970) without so much effort from the SERT; yet they may be the very things which need to be done if a program plan is to be operationalized. The way we wish for things to be are not always the way they are.

(b) Is the desired performance something the implementor does not have the skills to do? If so, two options exist.

(1) Establish a program to train the implementor to carry out the program. If, for example, the teacher does not know how to write behavior contracts with students as required by the program plan, the SERT can teach the teacher. Similarly, the teacher who cannot do a task analysis will have to be taught how to do so. Training the teacher is initially time consuming but it has long-term benefits in both the prevention and remediation of problems with other students. On the other hand, immediate program operationalization may require a less time-consuming solution. In such cases the second option may be used.

(2) Shift the implementation responsibilities to someone who already has the skills required for program operationalization, such as the SERT. But then the SERT would be moved into a direct service role, which may be undesirable. If the target child is likely to need service for an extended period, changing the child's teacher may be a good alternative. Changing teachers without conflict, however, requires careful and sensitive management and is most easily done where the reassignment of responsibility is common (as in team teaching).

The preceding strategies are not exhaustive. In general they include a wide range of alternatives for solving performance problems. (Mager & Pipe (1970) provide a more thorough understanding of the principles involved and, with practice, a limitless number of specific solutions can be generated from the principles.)

A case study follows in which a SERT consulted with a classroom teacher. It is presented to provide a model for consultation activity; however, it should not be construed as representative of all consultative possibilities. The case study format is a modification of the forms presented in Chapters IV-X and it is used by the SERT to structure the consultation with classroom teachers. The modifications meet the requirements of the consultative arrangement. Thus they do not include information on the eligibility decision or formal periodic reviews of the student's program by the building team.

Do's and Don'ts for Consultants[1]

DO

- remember that people are capable of solving their own problems
- try to accept others' values
- be fully aware of your own values
- have a specific way that teachers can get your help
- be knowledgeable about all school & community resources available
- to save time & help more teachers, learn how to use your services; meet with a teaching team or department at meeting times
- have a wide variety of materials to help teachers
- let teachers know you value their knowledge
- try to be involved in school activities

DON'T

- tell a teacher you will help with a child without spelling out exactly what you think your responsibilities are
- don't schedule yourself so tightly that you don't have time to meet with teachers for immediate consultation
- act as if you have all the answers to solve a teacher's problem
- become the "middle man" to take teacher's gripes to the principal
- don't push when the consultee is not ready to move
- don't let your need to help get in the way of the needs of the consultee
- don't expect to see immediate results --you'll get discouraged

There follow the matrix questions for the process of consultation and training through the four decision areas and program phases. If you recall, these questions were omitted from the flow charts presented in Figures II-3, 4, 5, and 6. The case study follows the matrix questions.

References

Mager, R. F., & Pipe, P. *Analyzing performance problems.* Belmont, Calif.: Fearon, 1970.

Parker, C. A. (Ed.). *Psychological consultation: Helping teachers meet special needs.* Reston, Va.: Council for Exceptional Children, 1975.

Tharp, R., & Wetzel, R. *Behavior modification in the natural environment.* New York: Academic, 1969.

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[1] Adapted from material developed by Diagnostic Prescriptive Teachers, Minneapolis Public Schools.

Process: Consultation and Training

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED
DECISION AREA: *Problem Selection*		*PROGRAM PHASE:* *Intake Assessment*
4. Can the SERT help or train others to select problems for program modification? Are there other persons who can be helped or trained to collect discrepancy data, conduct interviews, and establish priorities and eligibility for service?	See Chapters IV, V, and VI.	Consult with or train others (aides, regular class teachers) to collect discrepancy data, conduct interviews, and establish priorities and eligibility for service.
DECISION AREA: *Program Selection*		*PROGRAM PHASE:* *Program Planning*
8. Can the SERT help or train others to select programs? Are there other persons who can be helped or trained to propose alternative programs, write objectives, determine measurement procedures?	See Chapter VII.	Consult with or train others to propose alternative programs, write objectives, and determine measurement procedures.
DECISION AREA: *Program Operationalization*		*PROGRAM PHASE:* *Implementation Evaluation*
12. Can the SERT help or train others to operationalize program plan? Are there other persons who can be helped or trained to implement programs, measure performance, and evaluate extent to which program plan is being implemented as proposed?	See Chapter VIII.	Consult with or train others to implement, measure, and evaluate programs.
DECISION AREA: *Program Adjustment*		*PROGRAM PHASE:* *Progress Evaluation*
16. Can the SERT help or train others to improve programs? Are there other persons who can be helped or trained to evaluate progress, propose program changes, and adjust programs?	See Chapter IX.	Consult with or train others to evaluate progress and make recommendations for further program modification.
DECISION AREA: *Program Certification*		*PROGRAM PHASE:* *Outcome Evaluation*
20. Can the SERT help or train others to certify programs? Are there other persons who can be helped or trained to evaluate whether program should be terminated?	See Chapter X	Consult with or train others to evaluate program outcomes and determine whether program should be terminated.

CONSULTATION: SUMMARY REPORT

Teacher	SERT	Student's Name	Grade	Age
Ms. R.	Ms. J.	Devin P.	2	8

I. PROBLEM SELECTION

1. Who owns the problem?

Date

Are the problems those the teacher identifies? Ms. R. asked the SERT to help develop a program to increase assignment completion of one student in her class. At the present time the student is not completing more than one of five assignments per day.

Are the problems those the parent identifies? Parent is very concerned about student's work. She is willing to do whatever the school requires to help Devin improve. (See also attached questionnaire.)

Are the problems those the student identifies? Devin does not like school. He feels the teacher is always picking on him. He never gets free time as he is always being kept in to finish his work! This makes him very angry. (See also attached questionnaire.)

Other comments: Teacher believes Devin's problems are not due to skill deficiencies but are primarily a problem of motivation.

2. What problems have been identified as important?

	TEACHER	PARENT	STUDENT	OTHERS*	MEDIAN OR AVERAGE
Assignments Completed	1	1	No Opinion		1

*These are different for each student

A. Here the data collected during initial consultation with interested parties are summarized. The SERT and the teacher decide who will do each interview.

EXAMPLE

The SERT met with the teacher to pinpoint the problem.

Devin's parents and the regular class teacher met during regular conference period.

The SERT met with the student to give him the opportunity to express his views on the problem.

Each person interviewed was asked to rank the identified problems in terms of their relative importance.

CONSULTATION: SUMMARY REPORT

EXAMPLE OF A STUDENT QUESTIONNAIRE

Date ____________
Student's Name Devin P.

1. If I had three wishes I'd ask for candy, dinosaur model, comic books.
2. The best thing the teacher can do is not to yell at me.
3. My favorite game is bike riding.
4. I like to get pop and candy.
5. My best friend in school is John P.
6. The best place in the school is the playground.
7. The school period I like best is recess.
8. When I get my school work done I like to go out to play or have free time.
9. The best thing that could happen to me in school is to get my work done.
10. If I could do anything in school that I wanted, I would watch tv.
11. The most fun that I have in school is I don't like school.
12. The subjects I need the most help with are I don't know.
13. The subject I want to work on first is I don't know.
14. If I could have help with getting my work done I would be able to go out and play.
15. If I knew I could I don't know I'd work on my ____________ every day for at least ____________ mins./hours.
16. Ask student to complete the priority ranking sheet. (See also questions 12 & 13.)

Additional comments:

CONSULTATION: SUMMARY REPORT

EXAMPLE OF A PARENT QUESTIONNAIRE

______ Date	Devin P. Student's Name

A. What people does your child spend the most time with?

1. Younger brothers and sister
2. Mom and Dad
3. ______

Are there others he or she would like to be with?

Not particularly. Devin is a loner.

B. Where does your child spend the most time?

In front of tv.

Where would he or she like to spend more time?

Don't know.

C. List the things your child spends the most time with.

When not watching tv likes to play with dinosaur models, read comics, use magic marker pens.

List things your child does not have but would most like to have.

Magic marker pens

List best-liked foods and drinks.

Gum, candy, pop, hot dogs

D. List the activities your child spends the most time on.

Same

List activities he or she would like to spend more time on.

TV

E. Select and list four reinforcers which are the most powerful and which you are able to offer to your child contingent upon his or her behavior.

1. Models
2. Candy
3. Trip to McDonalds
4. Comic books

CONSULTATION: SUMMARY REPORT

Ms. R.	Ms. J.	Devin P.	2	8
Teacher	SERT	Student's Name	Grade	Age

3. What is desired performance?
4. What is actual performance?
5. Is there a discrepancy?

Date:

B. Here the data collected during initial assessment of the problem are summarized.

EXAMPLE

Nine consecutive days of baseline data were collected by Devin's teacher on assignment completion. The SERT summarized the data and plotted them on a daily performance graph.

BEHAVIOR	Assignments Completed			
DISCREPANCY	10.0X less than desired			

6. Is there a history of progress/performance problems?

Devin has no previous history of Special Education service or referral.

CONSULTATION: SUMMARY REPORT

Ms. R.	Ms. J.	Devin P.	2	8
Teacher	SERT	Student's Name	Grade	Age

7. Is the discrepancy important?

Date

Baseline data indicate that Devin completes 10.0X fewer assignments than assigned. The classroom teacher wants him to complete all assigned tasks, as she believes Devin will not be able to succeed in school if he is always falling behind in his work. Devin would like to complete work so he can have free time but at this time he says he can't work because he feels the teacher is always cross with him. Devin's parents agree this is an important problem and would like to help in any way they are asked. If Devin is to succeed in school some assistance from an outside party seems appropriate.

C. The SERT writes a rationale for the importance of the problem in which she justifies the need for consultative service.

EXAMPLE

The SERT wrote the rationale regarding the importance of the problem and asked the teacher to review it and comment.

CONSULTATION: SUMMARY REPORT

Ms. R.	Ms. J.	Devin P.	2	8
Teacher	SERT	Student's Name	Grade	Age

8. Is consultation appropriate for this problem?

Date

This problem meets the criteria for consultation in H. school and therefore a program modification will be developed by the classroom teacher with the SERT's assistance.

D. The decision whether service will be provided is reached using criteria established at the school or district level.

EXAMPLE

In H. School this decision does not require a student support team staffing. Indirect service depends upon the SERT's previous time commitments and the type of problem presented.

The SERT assessed her time commitment and the appropriateness of this problem for consultative service. Based on the rationale regarding the importance of the problem the SERT agreed to provide assistance to the teacher in developing a program for Devin.

CONSULTATION: SUMMARY REPORT

Ms. R.	Ms. J.	Devin P.	2	8
Teacher	SERT	Student's Name	Grade	Age

Date:

II. PROGRAM SELECTION
1. What performance discrepancies have been identified?
2. What is the administrative plan?

List discrepancies for which program modification will be developed during consultation.

Assignments
Completed

Outline general plan and administrative arrangement.

The classroom teacher and SERT will develop a contract which describes the responsibilities of all parties. The contract format will also be used between Devin and the teacher. Contingencies for completing assignments will be specified. A daily task card will be filled out by the student and teacher indicating assignment completion.

E. In consultation with the teacher a program plan is developed.

EXAMPLE

Together, the teacher and the SERT developed the program plan which is outlined here.

CONSULTATION: SUMMARY REPORT

Consultation Agreement

Teacher Responsiblities

1. Write a contract with student.
2. Help student fill in the task card.
3. Remind student to fill in his/her name and date at the beginning of each day.
4. Briefly discuss the task card with student at the end of the day.
5. Sign each task card at the end of the day.
6. Develop a set of potential reinforcers for Devin to earn.
7. Make sure Devin has time for the activities he earns each day.

SERT Responsibilities

1. Inform all personnel involved of their responsibilities under the contract.
2. Provide task cards for Devin and the teacher.
3. Summarize data collected by the teacher and plot them on the performance graph(s).
4. Help the teacher to develop a set of potential reinforcers for Devin.
5. Meet with the teacher weekly to evaluate the program and set new goals.

Procedures for Implementing Plan

1. At the beginning of each assignment make sure that Devin understands the directions for completing the task and what is expected of him.
2. Be sure Devin knows what potential activities he can earn.
3. At the end of the day, fill out the Daily Task Card with Devin and make sure it is marked correctly. If the assignments are not completed, try to pinpoint the reason and write it on the bottom of the form.
4. Take the reasons for not completing the assignments under consideration when planning the next day's assignments.
5. Be sure Devin has time for the activities he earns each day.

CONSULTATION: SUMMARY REPORT

Ms. R.	Ms. J.	Devin P.	2	8
Teacher	SERT	Student's Name	Grade	Age

3. What interventions are proposed to reduce the discrepancy?

Date

	CONDITIONS	BEHAVIOR	CRITERIA
Long Range	By the end of the school year when given a set of assignments to complete	Devin will complete tasks assigned	100% of the time.
Weekly	Each week when given a set of of assignments to complete	Devin will complete tasks assigned	at a median percentage which is at least 10% greater than the previous week.

Contract 1 - Devin can earn 10 min. of free time at the end of the day if all tasks assigned are completed and checked off.

Contract 2 - Devin can earn 10 min. of free time before lunch if all assignments for the morning are complete.

Contract 3 - Devin can earn 1 sticker for each assignment completed which he can trade for a variety of items (see contract).

F. Long range, weekly, daily objectives and program changes for each program modification are written by the SERT and the teacher. Graphs are selected and responsibilities for collecting and summarizing data are assigned.

EXAMPLE

Together the teacher and the SERT wrote long-range and weekly program objectives.

4. What are measurement procedures?

What behavior will be monitored?	Assignments Completed
Who will collect data?	Teacher
Who will graph data?	Teacher
Who will summarize data?	SERT
Who will evaluate data and develop new goals and program changes?	SERT and teacher

What graphs will be kept?

MONTHLY	PROGRESS	PERFORMANCE
WEEKLY	PROGRESS	[✓ PERFORMANCE]
[✓ DAILY]	PROGRESS	PERFORMANCE

EXAMPLE

Graphs and measurement procedures were selected.

CONSULTATION: SUMMARY REPORT

Task Card 1

Devin

Devin will get a √ for every assignment completed during the morning. At the end of the day Devin will get 10 minutes of free time if he has completed all his assignments for the day.

Student's Name ______________________________

Date ______________________________

Tasks Assigned ______________________________

# Tasks Completed ______________________________

Tasks Not Completed ______________________________

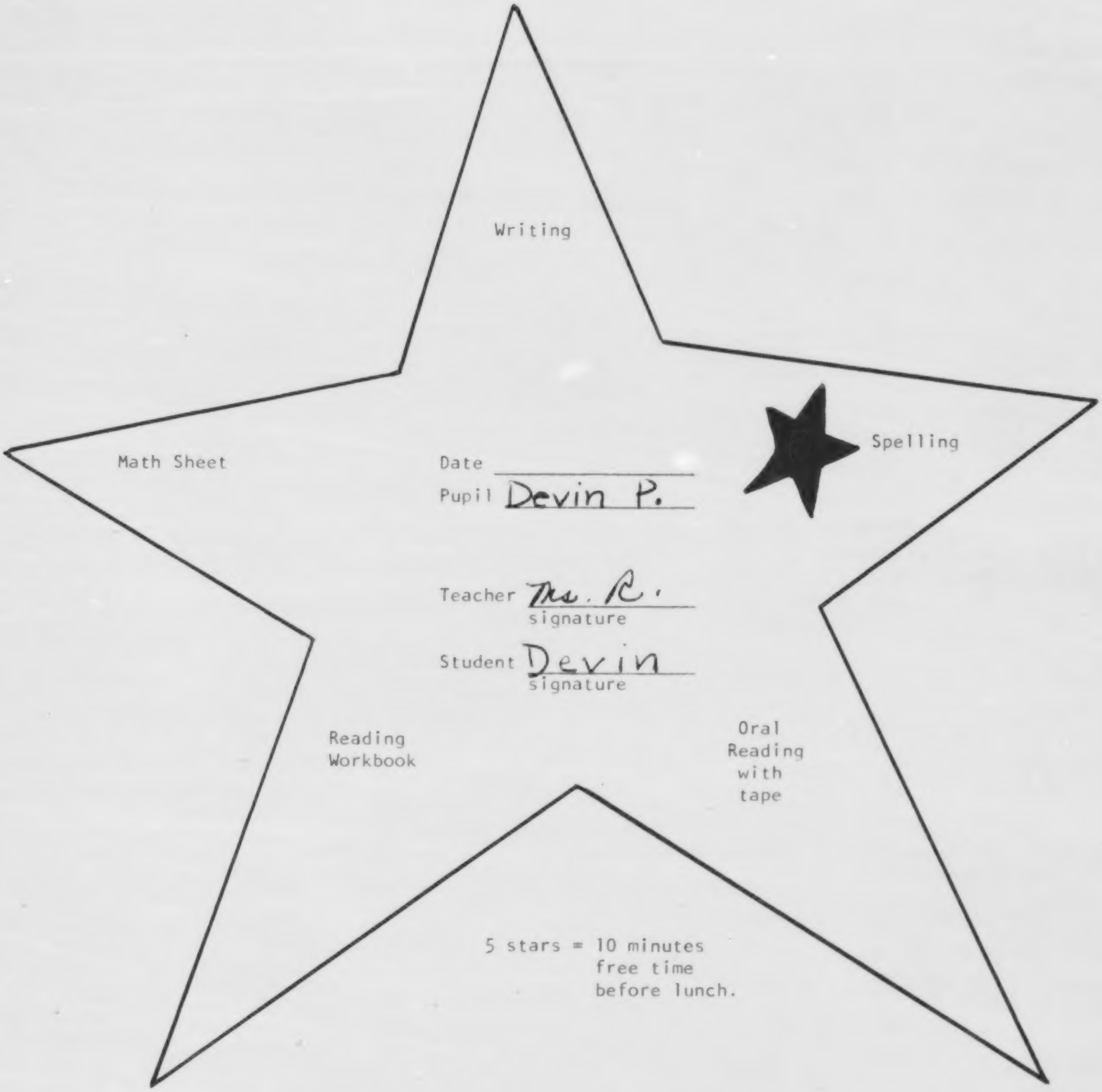
Student's Signature ______________________________

Teacher's Signature ______________________________

CONSULTATION: SUMMARY REPORT

Task Card 2

Devin


Writing
Spelling
Math Sheet
Reading Workbook
Oral Reading with tape

Date ____________

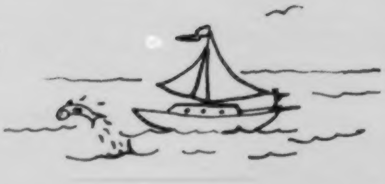
Pupil Devin P.

Teacher Ms. R.
signature

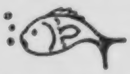
Student Devin
signature

5 stars = 10 minutes
free time
before lunch.

Contract (3)

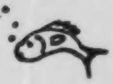


DATE:

I DEVIN P. agree to complete assignments given to me each morning. I shall list each one on my task card and shall receive one  for each task I do.

I can trade my stickers for:

3 stickers = 1 piece of candy
10 stickers = magic marker/felt tip
15 stickers = comic
40 stickers = a dinosaur model

I Ms. J agree to present Devin with a  for each assignment he completes each morning. I will also initial his task card.

I Ms. R. agree to provide task cards, stickers and tangible reinforcements for Devin's program.

CONSULTATION: SUMMARY REPORT

Ms. R.	Ms. J.	Devin P.	2	8
Teacher	SERT	Student's Name	Grade	Age

III. PROGRAM OPERATIONALIZATION AND ADJUSTMENT

1. Is program plan being implemented as proposed and accepted?
2. Are changes being made systematically?

Date

G. Daily reviews of the program during the first week are imperative! The SERT need only "stop by" momentarily. Subsequently reviews are scheduled weekly and summarized in log form as noted here.

EXAMPLE

The log kept by the SERT for this consultation is reported here.

Day 1

Date

SERT met with teacher to review data and discuss problems which may have occurred. Teacher had not filled out task card with the student as there had been a fire drill at the end of the day.

Day 2

Date

SERT left note on teacher's desk before school to remind her about task card. Check again at end of day showed that the student had not completed any assignments.

Day 3

Date

50% assignments were completed today but teacher expressed concern that feedback is too remote. Decided to wait until Friday and then decide if Contract 2 should be implemented.

Day 5

Date

A check at end of day indicated 66% assignment completion. Decided to continue as above for another week.

Day 10

Date

Devin's performance is very variable. Teacher will implement Contract 2.

Day 15

______
Date

Devin completed 80% assignments on the first day of the new contract and 100% on the second day. His performance is still variable but will continue this contract for another week as % correct per day is still above the estimated performance line.

Day 20

______
Date

All data points were plotted below the line this week. Contract 3 will be implemented next week.

Day 25

______
Date

Devin completed 100% of assignments for two days this week!

Day 30

______
Date

Four 100% days!!!

Day 35

______
Date

Despite an initial drop to 60% on Monday, Devin completed 100% assignments on 3 days.

Day 40

______
Date

100% on four of five days. Teacher will continue this program without further assistance from SERT.

CONSULTATION: SUMMARY REPORT

Teacher	SERT	Student's Name	Grade	Age
Ms. R.	Ms. J.	Devin P.	2	8

IV. PROGRAM CERTIFICATION

1. Did program produce cumulative benefits for the student?
2. Which changes had greatest effect on performance?

Date

H. The data for the program were summarized by the SERT.

EXAMPLE

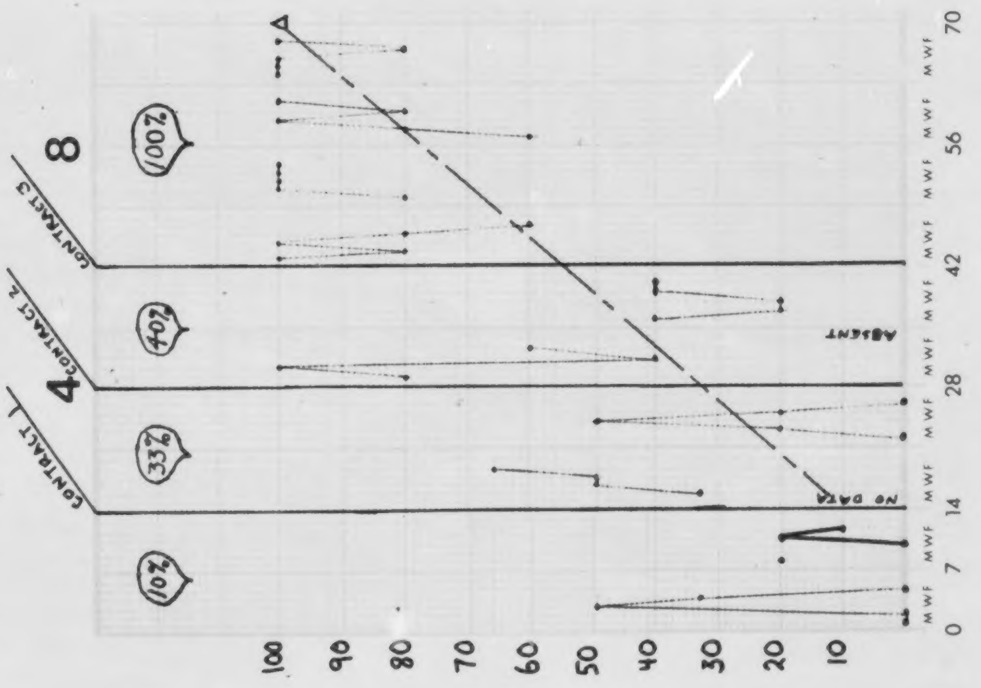
The data for Devin's program were summarized by the SERT.

Performance increased during all program phases.

	% Assignments Completed
Baseline	10%
Change 1	33%
Change 2	40%
Change 3	100%

Summarize discrepancy data.

Baseline	10.0X less than desired
Change 1	3.0X less than desired
Change 2	2.5X less than desired
Change 3	1.0X - No Discrepancy
Change Over Initial Assessment	10.0X smaller



CONSULTATION: SUMMARY REPORT

Ms. R.	Ms. J.	Devin P.	2	8
Teacher	SERT	Student's Name	Grade	Age

3. What recommendations are there for further program modification?

Date

Teacher will continue to implement Phase III of program. The reinforcement "menu" appears to have been the most effective change planned for Devin's program.

I. Teacher and SERT try to identify which changes had the greatest effect on performance.

EXAMPLE

The SERT and teacher met to evaluate changes and decide on future program plans for Devin.

V. PROGRAM CERTIFICATION

1. Should consultation be terminated?
2. Has consultation been successful in reducing the discrepancy?
3. Has consultation satisfied the needs of all interested parties?

Consultation has been successful in reducing the discrepancy. SERT will continue to check with teacher to see if student maintains this same level of performance.

J. Teacher and SERT review program plan and summary discrepancy data.

EXAMPLE

The SERT and the teacher also certified program completion.

4. Continue/[✓ Terminate] Consultation

Date

Ms. J.
SERT

Ms. R.
Teacher

APPENDIX A

Matrix Questions

DECISION AREA: Problem Selection PROGRAM PHASE: Initial Assessment

PROCESS: Communication and Collaboration

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
1. Who owns the problem?	Referral form. ①	Acknowledge receipt of form. ①		
Are the problems those the teacher identifies?	Procedures for arranging teacher conference. ② Format for teacher conference. ③	Arrange and conduct conference with teacher. (2 & 3)		
Are the problems those the student identifies?	Procedures for arranging student conference. ④ Format for student conference. ⑤	Arrange and conduct student conference. (4 & 5)		
Are the problems those the parent identifies?	Procedures for arranging parent conference. ⑥ Format for parent conference. ⑦	Arrange and conduct parent conference. (6 & 7)		
Are the problems those the school principal or other professionals identify? Are they shared problems?	Procedures for arranging staffing; consultations. ⑧	Arrange staffing; consultation or data gathering by other professionals. ⑧		
Should other professionals be consulted?				
Do those who identify problem(s) have priorities as to their importance?	Procedures for determining priorities. ⑨	Ask appropriate parties to complete priority form. ⑨		
		Summarize data on Case Report Summary One. ⑩		

DECISION AREA: Problem Selection PROGRAM PHASE: Initial Assessment PROCESS: Measurement

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
2. Is there a discrepancy between desired and actual performance?	Curriculum materials used in referred student's class.			
Are there desired academic progress expectations?	Procedures to collect data on desired progress for average students. ①	Collect data on desired progress for average students. ①		
Are there desired academic performance expectations?	Procedures to collect data on desired performance for average students. ③	Collect data on academic performance of average students. ③		
Are there desired expectations for social behavior?	Procedures to collect data on social behavior of average students. ⑤	Collect baseline data on social behavior of average students. ⑤		
What is the target student's actual level of academic progress?	Procedures to collect data on actual academic progress of target student. ②	Collect baseline data on academic performance of target student. ②		
What is the target student's actual level of academic performance?	Procedures to collect data on actual academic performance of target student. ④	Collect baseline data on academic performance of target student. ④		
What is target student's performance in social behavior?	Procedures to collect data on social behavior of target student. ⑤	Collect baseline data on target student's social behavior. ⑤		
What is the discrepancy ratio?	Procedures to graph data on desired and actual progress/performance. ⑥	Appropriately title and label graphs. Plot data on graphs. ⑥		
	Procedures to compute discrepancy ratios. ⑦	Compute discrepancy ratio and record on worksheet. ⑦		
Is there data on past progress/performance?	Cumulative folder data. ⑧	Summarize data pertinent to present priorities and problems. ⑧		
		Summarize data on Case Report Summary Two. ⑨		

DECISION AREA: Problem Selection PROGRAM PHASE: Initial Assessment PROCESS: Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
3. Is the student eligible for service?	Guidelines for making the eligibility decision. ①			
Have important discrepancies been identified?	Procedures to review and evaluate data. ②	Review discrepancy data and select discrepancies which meet criteria. ②		
Can a rationale be established for the importance of the problem?		Write a rationale for the importance of the problem on Case Report Summary Three. ②		
Does student meet eligibility requirements?		Convene staffing to make eligibility decision. ② Summarize decision on Case Report Summary Four. ②		

DECISION AREA: Program Selection PROGRAM PHASE: Program Planning PROCESS: Evaluation

5. What program plans are proposed?				
For which identified discrepancies will programs be developed at this time?	Procedures to select discrepancies to be modified. ①	Select discrepancies for which a program will be developed on Case Report Summary Five. ①		
What program objectives are proposed for these behaviors? What progress/performance is estimated? How long an intervention is planned?	Procedures to write objectives. ②	Compute progress/performance estimates; select intervention period; write long- and short-term objectives for each discrepancy on Case Report Summaries Five and Six. ②		
What program changes are proposed?	Guidelines for specifying program changes. ③	Write at least two program changes for each objective on Case Report Summary Six. ③		
What resources are available to implement the plan?	Suggested alternative administrative arrangements. ④	Propose 2 alternative arrangements to implement plan on Case Report Summary Seven. ④		

DECISION AREA: Program Selection PROGRAM PHASE: Program Planning PROCESS: Measurement

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
6. How will effectiveness of program plan be measured?				
What procedures will be used to measure progress/performance?	Guidelines to select measurement procedures. ①	Specify procedures to measure behaviors and frequency of data collection on Case Report Summary Eight. ①		
How often will data be collected?				
What progress/performance is estimated?	Procedures to draw projected progress/performance estimate on graphs. ②	Draw projected progress/performance estimates on graphs. ②		

DECISION AREA: Program Selection PROGRAM PHASE: Program Planning

PROCESS: Communication and Collaboration

7. Does the program plan meet the expressed needs of referrer; student; parent; others?	Purpose of program plan review. ①	
Have all parties been involved in planning? Have all parties accepted plan?	Form to receive feedback on program plan. (Case Report Summary Nine) ②	Circulate Case Report Summary Nine to interested parties. Arrange program plan staffing if required. ②

DECISION AREA: Program Operationalization PROGRAM PHASE: Implementation Evaluation

PROCESS: Measurement

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
9. Is program being implemented as planned?				
Are measurements being taken? Are graphs being maintained for each pin-pointed discrepancy? Are data being recorded as planned?	Guidelines for implementing data collection activities. ①	Measure progress/performance. Plot data on graphs. ①		
Are program changes being made based on graphed data? Are changes noted on graphs?	Decision rules for making program changes. ②	Make program changes based on data. ②		

DECISION AREA: Program Operationalization PROGRAM PHASE: Implementation Evaluation

PROCESS: Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
10. Is program plan implemented as proposed?				
Are there a sufficient number of data points for each intervention? Are program changes frequent enough? Are changes made according to decision rules?	Guidelines for reviewing data. ①	Review graphed data and compare with program plan. Summarize results on Case Report Summary Ten. ①		

DECISION AREA: Program Operationalization PROGRAM PHASE: Implementation Evaluation
PROCESS: Communication and Collaboration

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
11. Are all parties aware of the extent to which the program is being implemented?	Purpose of periodic review meeting. ①			
	Staffing Request Form. ②	Hold periodic review meeting with team.		
		Reconcile any differences between program as planned and implemented.		
		Complete Parts Two and Three of Case Report Summary Ten. ②		

DECISION AREA: Program Adjustment PROGRAM PHASE: Progress Evaluation PROCESS: Measurement

13. What information is available on cumulative/progress/performance to date?	Guidelines for obtaining change data. ①	
What is median level of progress/performance for each change?	Procedures to compute medians. ②	Compute medians for each program change. ②
What is the discrepancy for each program change?	Procedures to compute discrepancy ratios. ③	Compute discrepancy ratios. ③
What is the change in the discrepancy ratio from initial assessment?	Procedures to compute change in discrepancy ratios. ④	Compute change in discrepancy ratios. ④
What is the direction (trend) of the data for each program change?	Procedures to draw trend of data for each change. ⑤	Draw trend lines. ⑤
What variability is there in performance for each change?	Procedures to determine variability and step changes. ⑥	Summarize variability and step change data. ⑥
Is there a step (up or down) at the point of change?		Complete Part One of Case Report Summary Eleven.

DECISION AREA: Program Adjustment PROGRAM PHASE: Progress Evaluation PROCESS: Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
14. Is the program as implemented producing cumulative benefits for the student?				
Are there positive data trends?	Practice in interpreting graphed data. ①	Evaluate summarized program change data on discrepancy ratio worksheet and graphs. Complete Part Two of Case Report Summary Eleven. ①		
Are there positive changes in discrepancy ratios over initial assessment?				
Were some program changes more effective than others?				
Will programs for other behaviors identified as high priority during initial assessment be implemented at this time?		Develop objectives and graphs for each new behavior. Select program changes for each objective. Draw projected progress/performance estimates on graphs. Circulate form to receive feedback. (See Chapter VII.) ②		

DECISION AREA: Program Adjustment PROGRAM PHASE: Progress Evaluation
PROCESS: Communication and Collaboration

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
15. Can information gathered on program changes be useful to others?	Purpose of periodic review meetings. ①	Summarize recommendations for further program improvement on Part Three of Case Report Summary Eleven. ①		
Are all interested parties informed of progress?	Staffing Request Form. ②	Hold periodic review meeting with team, parent, student.		
Are there recommendations for program adjustments?		Share data on student progress/performance with team, parent, student. Discuss recommendations for further program improvement. Complete Case Report Summary Eleven. ②		
		Continue program as recommended. Repeat review process at regular intervals.		

DECISION AREA: Program Certification PROGRAM PHASE: Outcome Evaluation
PROCESS: Measurement

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
17. What are present progress/performance discrepancies?				
What are present discrepancy ratios for all behaviors during the program?	Collecting summary data for the program certification decision. ①	Summarize data on the discrepancy ratio worksheet. Draw trend lines. Complete Part One of Case Report Summary Twelve. ①		
What is the present trend of the data?				

DECISION AREA: Program Certification PROGRAM PHASE: Outcome Evaluation PROCESS: Evaluation

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
18. Should the program as presently planned and implemented be terminated/	Guidelines for program certification decision. ①			
Has program been successful in reducing the discrepancies?		Review Summary data. Summarize and make recommendation on Part Two of Case Report Summary Twelve. ②		
Can others assume responsibility for this student's program without assistance from Special Education personnel?				

DECISION AREA: Program Certification PROGRAM PHASE: Outcome Evaluation
PROCESS: Communication and Collaboration

19. Has program been successful in satisfying the needs of all interested parties.	Program certification review procedures. ①			
Are all concerned persons aware of program outcomes? Are all satisfied?	Staffing Request Form. ②	Hold program certification review with team, parents, student. Make program certification decision. Summarize results on Part Three of Case Report Summary Twelve. ②		

PROCESS: Consultation and Training

QUESTIONS	MATERIALS NEEDED	ACTION REQUIRED	ENTRY LEVEL	MASTERY
DECISION AREA: Problem Selection	PROGRAM PHASE: Intake Assessment			
4. Can the SERT help or train others to select problems for program modification? Are there other persons who can be helped or trained to collect discrepancy data, conduct interviews, and establish priorities and eligibility for service?	See Chapters IV, V, and VI.	Consult with or train others (aides, regular class teachers) to collect discrepancy data, conduct interviews, and establish priorities and eligibility for service.		
DECISION AREA: Program Selection	PROGRAM PHASE: Program Planning			
8. Can the SERT help or train others to select programs? Are there other persons who can be helped or trained to propose alternative programs, write objectives, determine measurement procedures?	See Chapter VII.	Consult with or train others to propose alternative programs, write objectives, and determine measurement procedures.		
DECISION AREA: Program Operationalization	PROGRAM PHASE: Implementation Evaluation			
12. Can the SERT help or train others to operationalize program plan? Are there other persons who can be helped or trained to implement programs, measure performance, and evaluate extent to which program plan is being implemented as proposed?	See Chapter VIII.	Consult with or train others to implement, measure, and evaluate program.		
DECISION AREA: Program Improvement	PROGRAM PHASE: Progress Evaluation			
16. Can the SERT help or train others to improve programs? Are there other persons who can be helped or trained to evaluate progress, propose program changes, and adjust programs?	See Chapter IX.	Consult with or train others to evaluate progress and make recommendations for further program modification.		
DECISION AREA: Program Certification	PROGRAM PHASE: Outcome Evaluation			
20. Can the SERT help or train others to certify programs? Are there other persons who can be helped or trained to evaluate whether program should be terminated?	See Chapter X.	Consult with or train others to evaluate program outcomes and determine whether program should be terminated.		

APPENDIX B

Case Report Summaries

CASE REPORT SUMMARY ONE

Student Grade Age Teacher

I. PROBLEM SELECTION

1. Who owns the problem?
   Are the problems those that teacher/parent/student/others identify?
   What are the priorities?

Summarize interview data here.

Are the problems those the teacher identifies?

Are the problems those the parent identifies?

Are the problems those the student identifies?

Other Comments:

Summarize the priority rankings here.

	TEACHER	PARENT	STUDENT	OTHER*	MEDIAN OR AVERAGE
*Behaviors					

*These are different for each student.

CASE REPORT SUMMARY TWO

Student

Grade

Age

Teacher

2. Is there a discrepancy between desired and actual performances?
What are the discrepancy ratios for high priority behaviors?
What data are available on past history of progress/performance?

List the priority behaviors and discrepancies here.

BEHAVIOR						
DISCREPANCY						

BEHAVIOR						
DISCREPANCY						

Summarize appropriate data from cumulative file here.

CASE REPORT SUMMARY THREE

Student	Grade	Age	Teacher

3. Is the student eligible for service?
   Have important discrepancies been identified?
   Can a rationale be established for the importance of the problem?

Write a rationale for the importance of the problem here.

Date Completed ____________________

By ____________________

CASE REPORT SUMMARY FOUR

Student	Grade	Age	Teacher

3. Is the student eligible for service? (cont.)
Does the student meet established eligibility requirements?

Summarize the results of the staffing here.

Date Completed ______________________ Participants ______________________

By ______________________ ______________________

____

____

____

CASE REPORT SUMMARY FIVE

Student	Grade	Age	Teacher

II. PROGRAM PLANNING

5. What program plans are proposed?
For which identified discrepancies will program plans be developed at this time?
What progress/performance is needed to reduce the discrepancies?

List discrepancies for which program modifications will be developed.

Summarize estimates of progress/performance needed to reduce the discrepancies here.

TIME

BEHAVIORS

CASE REPORT SUMMARY SIX

Student	Grade	Age	Teacher

5. What program plans are proposed? (cont.)
What program objectives are proposed?
What program changes are proposed?

List long-range, weekly, daily objectives and program changes for each program modification here.

	CONDITIONS	BEHAVIOR	CRITERIA
Long Range Behavior			
Daily or Weekly Behavior			

Change 1 ______________________________

Change 2 ______________________________

Change 3 ______________________________

	CONDITIONS	BEHAVIOR	CRITERIA
Long Range Behavior			
Daily or Weekly Behavior			

Change 1 ______________________________

Change 2 ______________________________

Change 3 ______________________________

	CONDITIONS	BEHAVIOR	CRITERIA
Long Range Behavior			
Daily or Weekly Behavior			

Change 1 ______________________________

Change 2 ______________________________

Change 3 ______________________________

CASE REPORT SUMMARY SEVEN

Student	Grade	Age	Teacher

5. What program plans are proposed? (cont.)
What resources are available to implement the plan?

Propose several possible program arrangements here.

Behavior	Program Arrangement	Type of Instruction	Time	Implementor	Place
	1	Direct Group Indirect Individual		SERT AIDE CLASS TEACHER OTHER PEER	Resource Room Classroom Other
	2	Direct Group Indirect Individual		SERT AIDE CLASS TEACHER OTHER PEER	Resource Room Classroom Other
	1	Direct Group Indirect Individual		SERT AIDE CLASS TEACHER OTHER PEER	Resource Room Classroom Other
	2	Direct Group Indirect Individual		SERT AIDE CLASS TEACHER OTHER PEER	Resource Room Classroom Other
	1	Direct Group Indirect Individual		SERT AIDE CLASS TEACHER OTHER PEER	Resource Room Classroom Other
	2	Direct Group Indirect Individual		SERT AIDE CLASS TEACHER OTHER PEER	Resource Room Classroom Other

Date Completed ______________________________

By ______________________________________

CASE REPORT SUMMARY EIGHT

Student

Grade

Age

Teacher

6. How will effectiveness of the program plan be measured?
What graphs will be maintained for the program?
How often will data be collected?

Behavior to be measured	How materials are organized	What the teacher says	What the student does	Type of graph	Frequency of measurement	What is recorded on on graph
				Progress Performance	Daily Weekly Monthly	
				Progress Performance	Daily Weekly Monthly	
				Progress Performance	Daily Weekly Monthly	

This case report summary is an adaptation of a recording format presented by J. E. McCormack, Jr. in The assessment tool that meets your needs: The one you construct. *Teaching Exceptional Children*, 1976, 8(3), 106-109.

CASE REPORT SUMMARY NINE

Student	Grade	Age	Teacher

7. Does the program plan meet the expressed needs of the referrer? student? parent? others?
Have all parties been involved in planning?
Have all parties accepted plan?

Directions:
Circulate proposed plans (Case Report Summaries Five, Six, Seven, and Eight) to interested parties and solicit their program plan preferences on the form below.[1]

Enclosed are the plans which have been proposed for ____________________ program. Please read them and indicate your approval or disapproval of the plan and your choice of administrative arrangement. If you have concerns about the plan which need to be communicated in person, please stop in to see me in the resource room any morning before the start of school or call me at ____________________. If plans are not satisfactory a team meeting will be arranged.

____
SERT

____
Date

I have read the enclosed plans.

My preference is as follows:

		Preferences			
Behavior	Program Arrangement	Class Teacher	Parent	Student	Other Team Members
	1.				
	2.				
	1.				
	2.				
	1.				
	2.				
ACCEPT	PROGRAM OBJECTIVES AND CHANGES				
REJECT					

Please return to the SERT's mailbox as soon as possible so that the program may begin.

Program Plan: Accepted ____________________
Date

---

[1] To meet requirements of P.L. 94-142 a staffing may be necessary here.

CASE REPORT SUMMARY TEN

Student	Grade	Age	Teacher

III. PROGRAM OPERATIONALIZATION

9. Is program being implemented?
10. Is program being implemented as proposed?
11. Are all parties aware of the extent to which the program is being implemented as planned?

Summarize data from graphs here.

Date			
Number of Graphs	1 2 3 4 5 6		
Data Plotted?	YES/	NO	
Changes Made?	YES/	NO	
Are changes frequent enough?	YES/	NO	Comment

Summarize review meeting here.

Date

List changes required to reduce discrepancy between program plan and program implementation.

Date

CASE REPORT SUMMARY ELEVEN

Student	Grade	Age	Teacher

IV. PROGRAM IMPROVEMENT

13. What information is available on cumulative progress/performance to date?
What data are available for each program change?
What is the change in the discrepancy ratio from initial assessment?
Have programs been developed since the last periodic review?

Summarize data over program changes here. List behavior new since last periodic review.

Behavior	Trend	Level	Variability	Step at Intervention
	Positive Negative	Increase Decrease		Up Down None
	Positive Negative	Increase Decrease		Up Down None
	Positive Negative	Increase Decrease		Up Down None
	Positive Negative	Increase Decrease		Up Down None
	Positive Negative	Increase Decrease		Up Down None

14. Is the program as implemented producing cumulative benefits for the student?
Are there positive changes in the discrepancy ratio?
Were some changes more effective than others?

Behavior	Changes which were most effective

15. Can information gathered on program changes be useful to others?
Are all interested parties informed of progress?
Are there recommendations for future program modifications?

Behavior	Recommendations for changes Review Date ________

Present: ______________ ______________

______________ ______________

______________ ______________

CASE REPORT SUMMARY TWELVE

Student

Grade

Age

Teacher

17. What are the present progress/performance discrepancies?
What are the present discrepancy ratios for all behaviors modified during that program?
What are the present data trends?

Enter summary discrepancy and trend data here.[1]

BEHAVIOR	Present Discrepancy Date	Change Over Initial Assessment	Trend
READING PROGRESS			
MATH PROGRESS			
SPELLING			
NOISE			

18. Should the program as presently planned and implemented be terminated?
Has program been successful in reducing discrepancies?
Can others assume responsibility for this students program without assistance from Special Education?

Summarize data review and recommendations here.

19. Has program been successful in satisfying needs of all interested parties?
Are all parties aware of program outcomes?
Are all satisfied?

Summarize results of staffing here.

Date Completed ____________________

Present ____________________ ____________________

Continue Direct
Indirect

Terminate ____________________

---

[1] If decision matrix is used place matrix here.

APPENDIX C

Change Strategies

Change Strategies

TO INCREASE BEHAVIOR

1. *Potential Reinforcers*

   a. Social
   - Praise (verbal)
   - Praise (peer)
   - Praise (project posted)
   - Peer tutor
   - Attend to child
   - Teacher addresses student
   - Peer co-worker
   - Working with a friend
   - Positive note home
   - Positive telephone contact
   - Special responsibilities at school
   - Pick a friend to do something with
   - Share results of graphing with child every day
   - Tell student you "missed" him in special way
   - Talk with someone of her/his choice

   b. Activity
   - Make own book
   - Use typewriter
   - Free time to do preferred activity
   - Early dismissal
   - Be teacher and plan lesson
   - Go to media center
   - Spend time in library
   - Clean animal cage
   - Do favorite school work
   - Have child graph oral reading rates
   - Have teacher graph performance
   - Make graph for child to use to graph performance
   - Take a field trip
   - Use tape recorder, film strips, record player, other audio visual material
   - Be office assistant
   - Be cross-age tutor
   - Activity period of his/her choice

   c. Concrete
   - Stars and stickers
   - Candy
   - Money
   - Pencils, tablets, erasers, stationery, paper clips

   d. Indirect
   - Points, tokens chips, washers, check-marks, test scores, which can be exchanged for other reinforcers at a more appropriate time

2. *Potential Prompts*

   a. Verbal
   - Prepare individual cards with rules
   - Ask older child or peer who knows alphabet to practice with child
   - Talk about story in class
   - Suggest specific topic to write about
   - Topic cards to choose from
   - Suggest specific nouns to include
   - Suggest specific verbs to include
   - Suggest specific adjectives to include
   - Provide single sound auditory cue for word identification
   - Make contract with contingencies stated
   - Call student at home when absent

   b. Nonverbal
   - Look up answers on tables, matrix
   - Write down borrowed or carried numbers
   - Have child copy the letters as he says them
   - Have the child trace the letters as he says them
   - Use a stimulus picture for story telling
   - Chip trading
   - Concrete cues, blocks, chips, marbles, etc.
   - Use multi-based blocks
   - Time interval chart on desk: checks given every 5-10-15 min. for sitting still
   - Have student self-chart # of positive peer contacts; positive feelings
   - Have teacher or observer chart out-of-seat behavior and share the results with child every day
   - Set timer for varied intervals

   c. Modeling
   - Practice saying words on Language Master
   - Seating arranged to be surrounded by quiet students
   - Echoic reading
   - Copy spelling words from list
   - Copy correct letters and numerals from list

3. *Shaping*

   a. Shifting criterion
   - Reinforce for successive approximations to 100%
   - Increase criteria for mastery daily/weekly
   - Require gradual improvement in on-task behavior

- Reinforce for increasingly larger amounts of work
- Reward for increasing # min. in school, etc.
- Shape behavior by enforcing short intervals of appropriate behavior and then increase length of time required for reinforcer

b. Chaining (task analysis)

- Teach phonics
- Pinpointing slicing (practice on a smaller set)
- Work on simpler math operations before complex
- Work on spelling similar words

TO DECREASE BEHAVIOR

1. *Potential Time-Out*

- Remove opportunity to earn indirect reinforcers for 5 minutes
- Remove opportunity for social interaction for 5 minutes
- Remove opportunity to engage in preferred activities for 5 minutes

2. *Potential Response Cost*

- Fines
- Take away indirect, concrete, social reinforcers, or activity (tv, car, friends, etc.)

3. *Other Potential Punishers*

- Error correction
- Graph of error performance
- Sharing graphs of undesirable behavior
- Sad faces
- Red checkmarks

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